

UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF NORTH CAROLINA
ASHEVILLE DIVISION

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| STATE OF NORTH CAROLINA |) | |
| ex rel. Roy Cooper, Attorney |) | |
| General, |) | |
| Plaintiff, |) | No. 1:06-CV-20 |
| |) | |
| vs. |) | VOLUME 7A |
| |) | |
| TENNESSEE VALLEY AUTHORITY, |) | [1571-1711] |
| |) | |
| Defendant. |) | |
| |) | |

TRANSCRIPT OF TRIAL PROCEEDINGS
BEFORE THE HONORABLE LACY H. THORNBURG
UNITED STATES DISTRICT COURT JUDGE
JULY 22, 2008

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P R O C E E D I N G S

THE COURT: All right. Call your next witness.
Mr. Goodstein.

MR. GOODSTEIN: Thank you, Your Honor. North Carolina calls Bruce Buckheit.

MS. GILLEN: Your Honor TVA has a pending motion in limine seeking to preclude Mr. Buckheit from testifying, which I can summarize for you now if you wish.

MR. GOODSTEIN: Your Honor, our understanding of their motion is that it's directed to Mr. Buckheit's expert testimony. And Mr. Buckheit is a fact witness as well --

MS. GILLEN: Actually --

MR. GOODSTEIN: -- and he's been designated as a fact witness by North Carolina in its initial Rule 26 disclosure in this case. So that's been disclosed to TVA for a number of years. Mr. Buckheit is --

MS. GILLEN: Excuse me.

MR. GOODSTEIN: -- is going to be testifying from his personal knowledge, Your Honor. He was an Air Enforcement Director at the USEPA from 1996 until 2003, and, during that time period, TVA was investigated by the USEPA for violations of the Clean Air Act, and Mr. Buckheit was personally and directly involved in that investigation.

The investigation resulted in findings from USEPA that TVA had violated the Clean Air Act at its plants in

1 Kentucky, Alabama and Tennessee, by a number of the units
2 that are implicated in this case, Your Honor, and what the
3 testimony will show is that some of the emissions, at least
4 some of the emissions that North Carolina is complaining
5 about and concerned about in this case are, in fact, unlawful
6 emissions under the Clean Air Act, and that testimony is
7 going to be based on Mr. Buckheit's personal knowledge.

8 So it's reliable. It's directly relevant to this
9 case. It's certainly relevant to North Carolina's claim of
10 nuisance, since some of the emissions that are part of the
11 nuisance have been caused by unlawful emissions, and it's
12 certainly relevant to TVA's defense that they're
13 substantially in compliance with law.

14 So what I'd suggest, Your Honor, is that we proceed
15 with Mr. Buckheit's testimony and take it as far as we can on
16 a factual basis, and then we can take up the objection on the
17 expert portion of it.

18 Mr. Buckheit is an expert. He is an expert on
19 implementation of Clean Air Act. He was not only a director
20 of the Air Enforcement Division of the EPA, but he's also
21 currently on a state air quality control board and he is an
22 expert on the implementation of the Clean Air Act, and he's
23 going to address some of the issues that have been raised in
24 TVA's expert reports, in particular, Dr. Andersen's expert
25 report.

1 Dr. Anderson is also a former official of EPA.
2 She's going to be testifying for TVA regarding the
3 implications of the National Ambient Air Quality Standards
4 program. Mr. Buckheit is prepared to provide some testimony
5 on that also, based on his experience and training.

6 **THE COURT:** Was he on your list that you gave --

7 **MR. GOODSTEIN:** Yes, sir.

8 **THE COURT:** -- to TVA? So they've had it all the
9 time?

10 **MR. GOODSTEIN:** Yes. As I said, he was identified
11 as a fact witness from day one in our Rule 26 disclosures,
12 and then when the expert reports were exchanged, we provided
13 an expert disclosure by Mr. Buckheit.

14 **THE COURT:** And when was that?

15 **MR. GOODSTEIN:** That was within 30 days of when we
16 received the TVA expert reports. So it's an appropriate
17 rebuttal expert disclosure under the rules and under your
18 order, Your Honor, as we talked about the other day. And
19 they had some time in deposition with Mr. Buckheit as a
20 designee of North Carolina. He was certainly available to be
21 deposed fully on his expert disclosure report. And it's been
22 very clear since we issued that disclosure that we would be
23 tendering him as an expert witness as well as a fact witness.

24 **THE COURT:** All right.

25 **MS. GILLEN:** Your Honor, if I may. Thank you.

1 First of all, our motion is not about disclosure, a
2 disclosure objection. The issue with Mr. Buckheit's
3 testimony is he is an attorney, so that causes two issues.
4 The area that he may be qualified to testify on is an area
5 that the Court needs no help with, the law. And his area of
6 expertise is the law. And so, therefore, he is not a
7 toxicologist; he cannot testify to the standards of NAAQS,
8 et cetera.

9 As to the first issue, what Mr. Goodstein
10 characterizes as fact, factual testimony, I believe
11 Mr. Buckheit is seeking to testify about alledged violations
12 of the Clean Air Act that resulted from an investigation
13 Mr. Buckheit led as the director of EPA's Air Enforcement
14 Division, and that investigation and the Environment Appeals
15 Board proceeding were assessed by the Eleventh Circuit in a
16 case captioned *TVA v. Whitman*, which is recorded at 336 F.3d
17 1236.

18 The Eleventh Circuit exhaustively examined all the
19 ways that that proceeding lacked the hallmarks of due process
20 and summed up their findings by saying that the
21 administrative compliance order that the EPA had issued to
22 TVA is legally inconsequential and did not constitute final
23 agency action. The Eleventh Circuit, therefore, did not
24 assert jurisdiction and said the EPA must prove the existence
25 of a CAA, Clean Air Act, violation in district court, and,

1 until then, TVA is free to ignore the administrative
2 compliance order without risking the imposition of penalties
3 for non-compliance with its terms.

4 The EPA never did prove those allegations in
5 District Court. Mr. Buckheit seeks to come into this Court
6 and catalog those allegations and present them as fact, and
7 they are not.

8 Moreover, I believe Mr. Buckheit disclosed in his
9 report he's being paid \$250 an hour, which seems somewhat
10 inconsistent with characterizing him as a fact witness.

11 As to the second issue, Mr. Buckheit opining on
12 areas outside of the law, he's a lawyer; he's not a
13 toxicologist. He worked in EPA enforcement, not in policy
14 making. He may have conferred with policy makers, but he,
15 himself, was not. And so we would simply say that his
16 testimony is completely improper.

17 **MR. GOODSTEIN:** Your Honor, we can lay a proper
18 foundation for it. Mr. Buckheit has a law degree. He also
19 has two degrees in physics.

20 Thank you, Your Honor.

21 **THE COURT:** All right. I'll let him at least start
22 his testimony, and I'll rule as we go along as to the
23 objections that are made.

24 **MR. GOODSTEIN:** Thank you, Your Honor.

25 **MS. GILLEN:** Thank you, Your Honor.

1 **MR. GOODSTEIN:** If I may approach, Your Honor, I
2 have a binder for Mr. Buckheit's exhibits for the Court. It
3 also has a certified copy of the administrative order, one of
4 Mr. Buckheit's exhibits, in the inside cover.

5 Mr. Buckheit, can you step down so you can be
6 sworn, please?

7 **BRUCE BUCKHEIT,**
8 **being duly sworn, was examined and testified as follows:**

9 **DIRECT EXAMINATION**

10 **BY MR. GOODSTEIN:**

11 **Q.** Good morning, Mr. Buckheit. Can you state your full
12 name for the record, please.

13 **A.** Bruce Charles Buckheit.

14 **Q.** And how are you currently employed, Mr. Buckheit?

15 **A.** Well, I like to say I'm mostly retired, but I do some
16 independent consulting for a variety of clients.

17 **Q.** And you retired from the position of director of the Air
18 Enforcement Division of the US Environmental Protection
19 Agency?

20 **A.** I did.

21 **Q.** And you were in that position from 1996 until 2003?

22 **A.** 1997.

23 **Q.** 1996 [sic]. I'm sorry. 1996 until 2003.

24 I'm going to show you the first exhibit in order in your
25 binder, Mr. Buckheit. Should be Plaintiff's Exhibit 436.

1 And is that a copy of your CV?

2 A. It is.

3 Q. And you have described there your environmental
4 consulting practice and your membership -- or your position
5 as a member at the Virginia Air Pollution Control Group?

6 A. That's correct.

7 Q. Can you first give us an overview of your current
8 environmental consulting.

9 A. Yes. My environmental consulting opportunities include
10 assignments for both industry, states, and occasionally
11 environmental groups, but primarily industry, states and
12 state groups. They've ranged in variety of interesting
13 opportunities.

14 One project that I recently engaged in was for a company
15 that develops marketing opportunities or business
16 opportunities for large corporations, and it was at the
17 request of a Fortune 100 company to look at market
18 opportunities for that company to engage in CO2 gas
19 separation business opportunities. The company brought
20 together a multidisciplinary team to look at that issue for
21 it, and my role on the team was, among other things, to look
22 at what regulatory drivers or limitations there might be on
23 the companies thinking to join -- this is a global warming
24 issue -- to look at whether there would be market opportunity
25 for the company to get into the separating CO2 gases from

1 other gases for purposes of sequestration.

2 I have drafted testimony for state agencies respecting
3 preserving state's rights in CO2 legislation that might be
4 pending.

5 I have an agent project that I just finished, again for
6 the association -- the National Association of Clean Air
7 Agencies is the professional association of the managers of
8 Clean Air Programs at the state and local levels, and they
9 retained me to help them put together a model permit to use
10 for industrial boilers under the EPA's Air Toxics Program.
11 Because of some court development, the states now have to do
12 this job, and they retained me to help them figure out how to
13 do it; and that involved a lot of data gathering and data
14 crunching about what the current capacities and current
15 emissions of industrial boilers across the country were,
16 sub-categorizing it into what technologies might be available
17 to reduce those emissions, and then applying the tests that
18 Congress and the regulations set out to develop, what the
19 permit limits should be and what technologies might be
20 available to meet those permit limits. This is for
21 industrial, not for EGUs or electric generating units. And
22 that project just finished in June.

23 I had a large project right after Katrina with respect
24 to solid waste management issues, how and where solid waste
25 from the Katrina cleanup should properly be managed.

1 Those are some of the types of projects that I've been
2 involved with in my consulting activities.

3 As a member of the Virginia Air Pollution Control
4 Board -- that board is a statutory board under the Virginia
5 laws. The governor appoints -- it was originally five; now
6 it's seven members. Each member is required by the statute
7 to be an expert in air pollution matters. They're not all
8 lawyers, by any stretch. One is a professor of environmental
9 policy. The other is an engineer by training. So you have
10 to have expertise in air pollution matters, but it's not a
11 legal board.

12 The board has the direct authority in Virginia to
13 implement Virginia air laws, and we delegate to the Virginia
14 DEQ the day-to-day management of it. But when our
15 significant matters come up, the board can and often does
16 reserve those matters unto itself. The board -- we adopt
17 supervisions. We adopt the rules that Virginia needs to
18 adopt under federal law. They come to us to be approved and
19 entered. We set policy. I'm working right now on a
20 five-year plan for Virginia, where it's going to take itself
21 over the next five years.

22 And we have engaged in permitting activities. Most
23 notably, over the last year and a half, we had a large
24 controversial matter respecting the power plant that's just
25 south of Reagan National Airport, some very complex issues.

1 And then, just a few weeks ago, we were down in Wise
2 County where we -- the board took testimony and made
3 determinations as to what the appropriate emission
4 limitations should be for the new Dominion Power Plant in
5 Virginia City in western Virginia. So we were the permitting
6 authority for that. I spent several weeks researching what
7 might be comparable units in the country, identified one in
8 Puerto Rico and one in Pennsylvania, with the basis of the
9 study being the emissions limitations on this new power
10 plant.

11 Q. And you are appointed to the Virginia Air Pollution
12 Control Board for a four-year term by the governor, Governor
13 Kaine?

14 A. That's correct. And that position also requires
15 confirmation by the Virginia General Assembly.

16 Q. Looking at your CV, Mr. Buckheit, can you summarize your
17 educational background for us, please.

18 A. I have a bachelor's and master's degree in physics, and
19 then I turned to the dark side and went to law school.

20 Q. Um-hum.

21 A. And graduated from William and Mary in 1974.

22 Q. And you were employed by the federal government in the
23 administration and enforcement of federal laws related to
24 environment and safety, from approximately 1974 until 2003?

25 A. That's correct. December, 2003.

1 Q. Can you summarize your experience there?

2 A. My first ten years in the federal government, I was in
3 the Office of Chief Counsel for the National Highway Traffic
4 and Safety Administration. And the Chief Counsel's office
5 has four branches, if you will, and I, during my career,
6 rotated through each of them.

7 While in the General Law Division, I was assigned
8 responsibility for assuring compliance by the National
9 Highway Traffic and Safety Administration, or NHTSA, with
10 environmental laws. And there came a point where the
11 administrator was pursuing a regulation that would require
12 air bags in cars, and I noted that that action would likely
13 require preparation of a environmental impact statement. And
14 since NHTSA is a small agency, I was tasked by the
15 administrator to author the environmental impact statement
16 for air bags.

17 This involved testing, since what's in an air bag is
18 sodium azide -- it's rocket fuel -- which, when combusted,
19 forms nitrogen and NaOH, both of which are harmless. But
20 sodium azide itself is mutagenic, carcinogenic, and there
21 were concerns of what would happen if cars were shredded at
22 the end of their useful lives, and so we ran a number of
23 tests where we actually shredded vehicles and took
24 measurements -- this was at my direction -- and I ultimately
25 wrote the environmental impact statement for air bags.

1 I also spent several years in the rule-making section,
2 where I drafted auto safety rules applied to cars and trucks
3 and buses, working with the engineers. Most of my time was
4 spent in the litigation section, where we pursued violations
5 of federal motor vehicle safety standards and safety defect
6 findings by the agency and enforced those findings.

7 Again, NHTSA is a small shop and there were
8 opportunities for me to use both sides of my education early
9 on. There was a famous defect case involving the Pinto, Ford
10 Pinto automobile, which was highly controversial and well
11 publicized. At about the same time as that matter was
12 proceeding, a General Motors vehicle had been tested by our
13 engineers and, in a rear-end crash test, leaked, and that
14 would have been extremely controversial with General Motors
15 since Ford was undergoing the same highly publicized problem.
16 And so I was -- General Motors challenged the agency's
17 testing, and I was cast to go out to California for several
18 months at the test site, review our test procedures, see if
19 they were accurate, and I identified that there were some
20 inaccuracies. We corrected the design of the test equipment,
21 re-ran the tests, and General Motors acknowledged that the
22 testing was quite defensible and then went ahead and recalled
23 the vehicle.

24 So my career at NHTSA was sort of a mix of law and
25 technical issues. And after ten years there, I was recruited

1 to come on with the Justice Department. They were expanding
2 the old Pollution Control Division into the Environmental
3 Enforcement Section. And I worked there for a number of
4 years, initially, as counsel, and then as senior counsel in
5 the Environmental Enforcement Section.

6 There, in 1984, I litigated my first research review
7 case. I say -- I prosecuted by myself -- and did a number of
8 solid waste cases, a number of superfund cases, Clean Water
9 Act cases and Clean Air Act cases, including cases involving
10 steel mills, automobiles, almost any industrial sector you
11 can think of.

12 In '96, I was again recruited to apply for the job of
13 director of the Air Enforcement Division at the EPA.

14 Q. And I'm going to refer you to Plaintiff's 458A. And can
15 you identify that? It should be the next one in order in the
16 book.

17 Is this a description of the Air Enforcement Division
18 Director position that you assumed in 1996?

19 A. Yes. This looks like EPA's current web page that
20 describes the job for the public. Adam Kushner is the fellow
21 who succeeded me as Air Enforcement Director.

22 Q. So how would you describe the job, Mr. Buckheit?

23 A. Well, the position is in senior executive service. It's
24 a policy and management job. The shop is comprised of
25 engineers, scientists, and lawyers who work to establish

1 policy but also get involved in the direct investigation and
2 enforcement of what's called nationally significant cases.

3 Most enforcement investigation is conducted at the
4 regional level with regional engineers and regional counsel.
5 Cases are either pursued administratively in the regions or
6 they're referred to the Justice Department for prosecution.

7 What our shop does is it sets policy and seeks to
8 establish consistency and work with states, again to set
9 policy and establish consistency.

10 I noticed in one of the reports some discussion of the
11 credible evidence rule. That rule was prepared at our shop.
12 And that is the bulk of the work that we do on the stationary
13 source side.

14 On the mobile source side -- that's cars and trucks and
15 buses -- there is no delegation to the regions or states and
16 so our attorneys and engineers do the investigations directly
17 and either pursue the cases themselves or work with the
18 Justice Department to pursue the cases. Many of those cases
19 are small matters involving gas stations that don't convert
20 from winter fuel to summer fuel on time and things like that.
21 And so we have a field office out in Denver and a presence in
22 Ann Arbor, as well as our headquarters staff.

23 With respect to nationally significant cases, however,
24 that's where, you know, the office will step in and directly
25 supervise and manage something if it's really a major, major

1 matter.

2 Q. So what were your duties and responsibilities as Air
3 Enforcement Director at USEPA?

4 A. Well, I think I've pretty much described it. It's to
5 set policy, to manage the shop, to interact with senior
6 officials at EPA and the Justice Department and at the
7 states, again, to develop policies that are used to
8 consistently enforce the Clean Air Act across the country.

9 As an example, I think one of my biggest accomplishments
10 at EPA was to change the model of how investigations are
11 conducted or how the agency directs its resources. For many
12 years, you had what was called inspection base model, where
13 someone would go out and do an inspection, write up a report,
14 and then whatever happened, happened. And as a workload
15 management tool, regions were graded, if you will, on how
16 many inspections they did. And so that, over time, led to
17 what we call drive-by inspections, where if you're going to
18 be measured by how many inspections you do, maybe the best
19 way to get your numbers up is to do a number of inspections
20 on matters that don't -- aren't really significant. And so
21 you might identify what we call ankle-biting violations. And
22 there was always some level of complaint from industry over
23 that practice, and I had thought it was not a wise use of our
24 resources, so I worked to change how EPA accounted for its
25 resources, and that was basically to give regions credit

1 within our management system for investigations as opposed to
2 simple inspections. And in this way, one would encourage
3 regions to invest more heavily in matters that might take a
4 longer time to develop the case, but the case would be more
5 significant. And so that's the kind of policy work that I
6 was involved in.

7 Q. When you were Air Enforcement Director from 1996 until
8 2003, were you involved in investigations of New Source
9 Review violations?

10 A. Yes. One of the --

11 Q. Can you tell us what that is first, and then explain how
12 you were involved.

13 A. New Source Review was one of the several clean air
14 programs that, in its initial form, calls for a review, an
15 environmental review of new sources. If you want to build a
16 new power plant, such as the one that we just permitted in
17 Virginia, you need to come in and the agency will conduct an
18 environmental review. As part of that, the agency will look
19 at what is, quote, best available control technology, which,
20 in shorthand, is just model pollution controls, and before
21 you can commence construction, you must get a permit. If
22 you're in an area where the health standards are being met,
23 an attainment area, that's called a PSD permit. If it's a
24 nonattainment area, it's called a nonattainment New Source
25 Review Permit.

1 In the '70s, late '70s, Congress adapted that
2 requirement, changed that requirement, so that existing
3 sources which had previously been grandfathered would have to
4 undergo New Source Review if they modified the plant in such
5 a way that emissions were increased.

6 I did my first New Source Review case, as I mentioned,
7 in 1984, but late in my DOJ career, EPA had stumbled over an
8 industry-wide problem with the wood products industry where
9 it had across-the-board violations, and I led the DOJ team,
10 working with EPA, to resolve the first of those, which was
11 the Louisiana Pacific case. The agency then serially, one
12 after the other addressed those issues with respect to the
13 other companies in the industry, and that was a process that
14 took almost ten years to work through the industry. And this
15 is sort of important because it affected both my thinking and
16 the agency's thinking as to how to proceed on a policy level
17 where there's detected industry-wide problems. We discovered
18 at one point, I think in the late '90s, an industry-wide
19 problem with respect to heavy duty diesel engines -- and I'm
20 straying from NSR, but I'll come back -- where each of the
21 manufacturers, each of the makers and manufacturers of heavy
22 duty diesels had incorporated different software in the
23 engine control computers that basically turn off the
24 pollution control system when they were on the highway and
25 turned it back on when the system sensed it was being tested

1 for emissions. And we engaged in an industry-wide settlement
2 there and found that that was successful because each of the
3 companies knew that their competitors were at the same time
4 forced to change how they did business and comply with the
5 law.

6 So, from that experience, we learned that if you have an
7 industry-wide problem, it's better to approach it
8 industry-wide to try to resolve it rather than one at a time,
9 and that guided our thinking as we proceeded with subsequent
10 issues.

11 We learned at one point in time that there were
12 widespread violations of New Source Review requirements in
13 three industry sectors.

14 One sector was the refinery sector. And there, our very
15 sophisticated investigative techniques included hiring a
16 college kid to go through back issues of the "Oil & Gas
17 Journal," where the industry basically touted its large
18 expansions of existing refineries.

19 What was happening at the time was the number of
20 refineries was shrinking as the mom and pop, smaller
21 refineries, were gobbled up by the larger refineries, and
22 capacity at the remaining refineries expanded. So the
23 overall refinement capacity in the country stayed the same,
24 but you only had half as many refineries. To us, as
25 enforcers of these New Source Review rules, that suggested

1 that there had to be capacity expansions going on at the
2 existing plants, and so we embarked on, industry-wide, to
3 start negotiations, you know, with each of the companies, but
4 on a parallel basis, to try to resolve those issues. And, in
5 large part, we were successful in doing that.

6 We discovered similar issues in the pulp and paper
7 industry and in the coal-fired power plant industry. With
8 respect to the coal-fired power plants --

9 **MS. GILLEN:** Your Honor, I think we are starting to
10 get into a territory where TVA would object to this as
11 improper legal testimony, and I believe Mr. Buckheit is
12 starting to characterize EPA's enforcement position carried
13 out in litigation that is still proceeding and issues that
14 are still undecided in the courts of law across the country.

15 **MR. GOODSTEIN:** Your Honor, I think this objection
16 has been overruled.

17 **THE COURT:** It has, and is now overruled, yes.

18 **MR. GOODSTEIN:** Thank you, Your Honor.

19 **THE WITNESS:** With respect to the coal-fired power
20 plants, or EGUs, electric generating units, we read, in the
21 newspaper actually, that one part of EPA was commenting on
22 deregulation proposals in the environmental impact statement
23 associated with deregulating the generating industry, that
24 deregulation might lead to increased use of coal-fired power
25 plants, particularly in the west. And again, if you're

1 enforcing the New Source Review rules, that's sort of a
2 cautionary flag. We thought at the time that we would really
3 get into compliance assistance and that we would warn the
4 industry that if they expand their operations by way of
5 physical changes that increase emissions, that they should be
6 careful to go through the permitting process. But as we
7 started looking into it, we found that, over two decades, the
8 industry had been modifying and making physical changes to
9 their plants in a way that increased annual emissions and
10 should have gone through the permit process and should have
11 put on modern controls.

12 We started out with an initial group of ten or
13 twelve companies that we looked at: American Electric Power,
14 Synergy, TVA, and others. The investigations proceeded by
15 having our inspectors, either regional or headquarters folks,
16 go into the plants and obtain records. They are obtained
17 records that, for us, indicated what I would call probable
18 cause, although it's not a legal requirement, more a common
19 sense requirement.

20 We have authority at EPA to issue what's called 114
21 letters. These are mandatory information-gathering documents
22 that are issued under Section 114 of the Clean Air Act. But
23 we don't issue those, because they can have a fair amount of
24 work associated with it and have a burden on the respondent.
25 We don't issue those unless we have some real reason to think

1 that there may be a problem there.

2 And so after our initial gathering of information
3 from the plants and we thought we had reason to go further,
4 we issued a series of 114 letters to each of the companies
5 that we were looking at.

6 And I remember going to Knoxville with my staff, my
7 regional staff, to sit down and talk through these issues
8 with TVA, as we did with each of the other companies, to
9 indicate to them that we would be sending a 114 request, to
10 let us know if there was some way of rephrasing it, that if
11 we inadvertently write our request in a way that greatly
12 magnifies the burden, of course we would work with them,
13 et cetera. But we talked through the issues that we thought
14 we were seeing and identified them, and that we would be
15 proceeding with a formal investigation.

16 Q. Can you tell us what it means for a plant to be
17 grandfathered under the Clean Air Act?

18 A. Yeah. In the early days of the Clean Air Act, it was a
19 fundamental compromise that Congress looked at, and that was
20 that new sources should put on the best controls as they're
21 being built. And so we have two programs, one, the New
22 Source Review program, but also the New Source Performance
23 Standards program that drive in that direction.

24 Originally, it was thought that existing sources would
25 be phased out over time, so why bother, why spend the money.

1 So they were called grandfathered. They were excepted from
2 the New Source requirements. But then, after a few years,
3 Congress realized this wasn't working and in 1977 amended the
4 statute to require that existing sources be treated as new
5 sources if those folks were modified. Congress could have
6 picked a dollar trigger or an age or some other trigger to
7 say when a modification could occur, but Congress accepted
8 EPA's arguments that what the Clean Air Act should care about
9 is emissions, not dollars, not age, and so the trigger was if
10 there was a physical change or change in method of operation
11 that resulted in an increase in emissions, then, prior to
12 doing such a project, you are required to get a permit and
13 put on modern controls.

14 **Q.** So could you tell us what a life extension project is,
15 based on this experience in the coal-fired power plant
16 investigation under NSR?

17 **A.** Well, originally, most companies -- this is as we
18 learned in our investigation. Most utilities had it in mind
19 that there would be transition to solar and nuclear power
20 facilities, that electricity would be too cheap to meter.
21 That was sort of the popular thinking at the time. And so
22 they didn't worry about maintaining sort of in perpetuity
23 their coal-fired fleet because they didn't think they'd need
24 their coal-fired fleets anymore. And in the '40s and '50s --
25 well, I'd say the '40s, prior to air pollution laws, it was

1 common for coal-fired power plants to have a useful life of
2 30 years and then the plant would be scrapped because newer
3 designs would be more efficient.

4 Two things happened. One is we had Three Mile Island
5 and the other is we have the advent of air pollution laws
6 that require costly controls. And so the dynamic changed in
7 the industry.

8 When they realized that they weren't going to be
9 building a substantial fleet of new nuclear plants, the
10 companies generally, TVA included, looked back at their
11 existing fleet of coal-fired power plants and asked
12 themselves: What do we have to do to be able to supply power
13 to this country given that we're not going to be building new
14 nuclear plants? What do we have to do? Building new plants
15 is expensive and we have to put those pesky pollution
16 controls on them. What can we do to extend the life of our
17 existing units past the nominal 30-year design cycle.

18 And so we saw Duke and, also, TVA had a very specific
19 life-extension program, and these would be projects that, at
20 least EPA believed, were not routine. They would be -- it
21 would involve taking out substantial large components of the
22 boiler and replacing them in one piece. So instead of the
23 week-by-week or seasonal maintenance where -- I guess maybe I
24 should back up.

25 I know, Your Honor, you've heard this, but a boiler in

1 the earliest days was just simply a pot of water that you
2 boiled to make steam. That was inefficient and tended to
3 explode. And so these days boilers are miles of pipe filled
4 with water, and we heat the pipe, and that then heats the
5 water to generate the steam. And you have several bundles of
6 these pipes with water walls around the side. Then you have
7 other bundles that serve basically the purpose of either
8 increasing the temperature of the steam or things called
9 economizers. You're trying to recover the heat that would be
10 most energy efficient.

11 And, basically, we were looking at projects that were
12 significant capital projects but weren't the types of things
13 that you'd do on an ongoing basis, maybe once in a lifetime
14 in a plant, if ever. We replaced the whole box, all of the
15 them, instead of, on a weekend, patching and welding pipes
16 that might be leaking.

17 And so those are the kinds of things that different
18 companies engaged in in long-term planning, significant
19 capital expenditures to extend out the life of these plants,
20 now that they were operating in a nuclear-free world.

21 Q. So the New Source Review requirements were triggered by
22 a major modification that increased emissions substantially.
23 What is the requirement for that unit?

24 A. The requirement is, before you do such a project, you
25 get a permit, and the permit does require best available

1 control technology.

2 Q. What does that mean?

3 A. Well, best available control technology is a
4 determination made by a permitting agency. In practical
5 terms, for EGUs, it would mean FGDs for SO2. There would be
6 some argument about whether in 1980 it would be SCR or some
7 other NOx control device. But as time progressed, certainly
8 into the '90s, that SCR technology became more and more
9 accepted as BACT.

10 Q. Can you describe for us your involvement in the NSR
11 investigation of TVA when you were director of the Air
12 Enforcement Division?

13 A. Yes. As you can imagine, this matter was highly
14 sensitive within EPA. This was extremely controversial. It
15 was briefed, certainly, to the Assistant Administrator for
16 Enforcement, the Assistant Administrator for Air, General
17 Counsel to the Administrator, to the Assistant Attorney
18 General at the Justice Department -- I think to the Attorney
19 General of the Justice Department, but by the EPA, just short
20 of the DOJ.

21 We could not afford to be wrong. If we were going to go
22 out and make these public accusations, we had to be correct.
23 And so it would be my natural inclination to do this, but,
24 also, my management insisted that I be directly and
25 personally involved in looking at these issues. Again, we

1 had to be right.

2 And so I visited with our attorneys, DOJ attorneys, our
3 engineers, frequently. They would bring to me the evidence,
4 the calculations and the arguments, and I would review it
5 personally and then brief my management on the status of
6 where we're at.

7 I personally reviewed a number of TVA documents. One of
8 our principal sources of information about whether a project
9 should be assumed to have an emissions increase was TVA's
10 procurement documents, their internal documents. We
11 recognized that, as with any large organization, if you want
12 to obtain 20 or \$40 million in capital in your budget to do a
13 project that you would have to justify it.

14 So we looked at EPA -- TVA's internal justifications.
15 What was TVA telling their management was the purpose and
16 effect of these projects? And I personally reviewed a number
17 of those documents.

18 **Q.** And can you describe for us what the investigation that
19 you were personally involved in at TVA showed with regard to
20 the TVA system?

21 **MS. GILLEN:** Your Honor, I believe we're getting
22 into some hearsay.

23 **THE COURT:** Overruled.

24 **THE WITNESS:** What I personally saw and personally
25 reviewed was evidence that showed a number of projects

1 conducted by TVA for the express purpose of reducing what we
2 call forced outages. These are outages where there is
3 demand, but your system breaks and so you have to go off line
4 and you can't service your demand. If you reduce those
5 incidents of forced outages, you increase your utilization
6 during the year, and your annual emissions, necessarily. And
7 I personally reviewed and noted a number of instances where
8 TVA had conducted projects, quite significant projects, in
9 fact, some of them most significant projects we saw in the
10 course of our investigation across the industry, that I felt,
11 as did others in EPA and the Justice Department, constituted
12 violations of the Clean Air Act.

13 Q. And what year was this?

14 A. Our investigations commenced in -- I believe this is
15 industry-wide -- in February of 1997, and I think we were in
16 a position of making our findings in early 2000.

17 Q. And to your knowledge, have these violations that were
18 determined by EPA's investigation, had they been resolved;
19 had they been addressed by TVA?

20 A. No, they had not.

21 Q. And you were involved in some interactions with TVA
22 during that time period, during the investigation?

23 A. Yes. We very much hoped that EPA would -- we hoped to
24 be able to settle this matter with TVA. We hoped that, as a
25 federal agency, TVA would step up and be basically a leader.

1 **MS. GILLEN:** Your Honor, I'd like to object to
2 this, too. As he did in his expert report, I think
3 Mr. Buckheit is going to begin to reveal the content of
4 confidential settlement negotiations with TVA and perhaps
5 other utilities, and we object to that.

6 **MR. GOODSTEIN:** Your Honor, that was not my
7 question. My question was, as part of the investigation, was
8 Mr. Buckheit, personally involved in the meetings with TVA to
9 deal with the Section 114 information request issued by EPA,
10 and was he involved in receipt of documents and interviewing
11 of TVA employees during that investigation.

12 **THE WITNESS:** I'm sorry. Yes, I was.

13 **THE COURT:** All right. I'll let him answer that
14 question.

15 **MR. GOODSTEIN:** Thank you, Your Honor.

16 **THE WITNESS:** Yes, I was.

17 **BY MR. GOODSTEIN:**

18 **Q.** Can you describe for us your involvement in those
19 activities?

20 **A.** I reviewed the 114 requests before they went out to
21 ensure that they were consistent with those being submitted
22 to others and to make sure that they were not unnecessarily
23 burdensome.

24 I again, as I mentioned, went to Knoxville prior to that
25 to visit with TVA folks to discuss our investigation, talking

1 about what we would be seeking, and, thereafter, I interacted
2 with my staff and regional staff who were reviewing the
3 responses provided by TVA.

4 **Q.** And was there an administrative order and request for
5 information issued during that time period by USEPA Region 4?

6 **A.** I'm sort of puzzled because there were a number of them.
7 So, yes.

8 **Q.** Let me show you Plaintiff's Exhibit 377 for
9 identification. Can you identify that document?

10 **MS. GILLEN:** Your Honor, I'm cognizant of your
11 ruling, but TVA has an objection to this administrative
12 compliance order, and this is the -- this and many others
13 were found to be without legal consequence by the United
14 States Court of Appeals for the Eleventh Circuit in *TVA v.*
15 *Whitman*.

16 **THE COURT:** Yes, but they're not my circuit.

17 **MS. GILLEN:** I understand that, Your Honor. I just
18 wanted to note the objection to this exhibit for the record.

19 **THE COURT:** All right.

20 **THE WITNESS:** I'm familiar with this document.

21 **BY MR. GOODSTEIN:**

22 **Q.** Can you explain to us what it is. Can you identify it
23 for us and explain what it shows.

24 **A.** Well, this is the fourth amended order. There were a
25 series of orders issued by Region 4 in coordination with my

1 office and myself that represented our findings at the
2 conclusion, at that point in our investigation.

3 The reason there were a series of amended orders was
4 basically to extend the compliance date of the order. Under
5 the act, we're only allowed -- EPA orders have a one-year
6 life and cannot be renewed, so this was by consent of TVA to
7 extend the compliance dates to allow discussions to occur.

8 Q. And what did this order require of TVA?

9 A. Well, as we go through it, the order required several
10 things. One, it required them to obtain permits and put on
11 controls, and it required them to do an audit of other units
12 within their system other than those where we had
13 specifically identified violations.

14 TVA had advised us that in the course of transferring a
15 number of their records from paper to electronic storage, or
16 microfiche storage -- I don't recall which -- they were
17 unable to locate a substantial portion of the records
18 relating to a number of their plants, and so the audit
19 provision was an effort to direct a more in-depth search for
20 those documents. We felt that while we had information
21 sufficient to identify the violations that we did, we had not
22 received enough information to fully characterize TVA's
23 system.

24 Q. And did it contain an additional request for information
25 and an audit provision?

1 A. Yes. I think I just discussed the audit provision.

2 Q. Okay. So it also contained an additional request for
3 information.

4 A. It says it on the title. I'll have to look through it.

5 Q. Okay. And it required TVA to pursue permits for the
6 subject units?

7 A. Yes.

8 MR. GOODSTEIN: Your Honor, at this time we offer
9 Plaintiff's Exhibit 377 into evidence, and we have provided a
10 certified copy to the Court and a copy of the certification
11 to counsel, which we obtained from EPA Region 4.

12 THE COURT: All right. Let it be admitted.

13 (Plaintiff's Exhibit 377 received.)

14 BY MR. GOODSTEIN:

15 Q. Mr. Buckheit, could you describe for us what happened
16 after this order was issued and TVA received it?

17 A. There were a number of discussions at both staff level
18 and the administrator, the TVA board, and in the end the
19 matter wasn't resolved amicably.

20 And the Clean Air Act provides that, in response to,
21 when an administrative order is issued, the respondent has an
22 opportunity to confer with the regional administrator.
23 Again, this was obviously a nationally significant issue, and
24 so the administrator directed that the order be reviewed in
25 detail by the Environmental Appeals Board. The regional

1 administrator granted an opportunity, of course, to confer
2 with TVA administrator, and proceeded, in our view,
3 represented.

4 The agency has a number of administrative law judges who
5 hear day-to-day administrative enforcement matters, and it
6 also has a -- then, I think it was three-member. It might be
7 four or five members now -- Environmental Appeals Board that
8 sort of served as an appellate review for the ALJ processes.

9 In addition, the EAB is the direct, sort of, court of
10 appeals within the EPA administrative system. It receives
11 direct challenges to New Source Review permits issued by the
12 regions. And with that instruction, the EAB acts as the
13 administrator. So this is -- the EAB decision is the
14 administrator speaking.

15 The EAB charged one of the administrative law judges to
16 conduct an evidentiary hearing and gather information, but
17 not make findings, and then the EAB issued it's own lengthy
18 detailed view of the allegations. A number of the alleged
19 violations in the amended order were knocked out by the EAB
20 for one reason or another, but, in the end, the EAB
21 determined, as basically EPA's view, that a number of major
22 and minor NSR violations had occurred.

23 Q. I'm going to show you what's been marked as Plaintiff's
24 Exhibits 378 and 379 for identification. And can you
25 identify those and explain what they show?

1 **A.** The two tables that are shown are excerpts from the EAB
2 decision. Except for the title. The tables appear as part
3 of the text in the decision. And they are reflective of the
4 determinations of the Environmental Appeals Board as to --
5 in 378, it's the violations of the NSR rules with respect to
6 the noted pollutants that were determined by the EAB. Thus,
7 you see at Allen Unit 3, the EAB decided that violations of
8 the New Source Review rules had occurred with respect to both
9 NOx and SO2.

10 **Q.** All right.

11 **A.** 379 is violations of what's called minor New Resource
12 Review rules. These are state rules that operate sort of at
13 a level below the major NSR rules. They are violations of
14 the Clean Air Act, but, in my mind, they're not as
15 significant as the ones on the prior exhibit.

16 **Q.** Can you explain for us why you viewed the violations on
17 Plaintiff's Exhibit 378 as significant?

18 **A.** They're more significant in my view because of the
19 consequences that flow. Minor NSR rules are state rules that
20 either are used to regulate minor sources, small sources of
21 air pollution, or sort of as a gatekeeper.

22 In many states, the major New Source Review threshold,
23 for instance, for SO2, if a project has an increase of
24 40-tons a year, then it's subject. The minor New Source
25 Review rule would apply to a project that had any emission

1 increase, and it serves as a gatekeeper so the state can
2 check to see -- review the calculations of emissions of the
3 company in terms of whether, in fact, the modification is
4 causing a major increase.

5 **Q.** Okay. So let's look at Plaintiff's Exhibit 378.

6 Can you tell us why these violations of Clean Air Act
7 New Source Review provisions confirmed by the USEPA and
8 Environmental Appeals Board are significant to you based on
9 your experience?

10 **A.** They're significant, I guess, for two reasons. One, the
11 New Source Review provisions are among the most significant
12 provisions in the act in terms of what they require a company
13 to do. And this is part of our focus.

14 If you look at a violation of, for instance, a permit
15 limit and you determine that a company is exceeding the
16 permit limit by 10 percent 10 percent of the time, that might
17 be, in many folks' minds, a significant matter, and in some
18 circumstances it might be. However, that would result in a
19 one percent increase in emissions; a 10 percent increase
20 10 percent of the time. With a New Source Review violation,
21 you're basically exceeding the appropriate limits by a factor
22 of 9 all the time. So you have a 900 percent increase.

23 So New Source Review violations generally are considered
24 by the agency and by me as very significant violations.

25 In addition, this is -- TVA is one of the largest

1 systems in the country. At the time we were looking at this,
2 they were either first or second for SO2/NOx emissions in the
3 country. They were first in one and second in the other, and
4 AEP was the other leader in the category.

5 These are some very large units that emit very large
6 quantities of air pollution, and some of the modifications
7 that we saw were extremely significant where the threshold is
8 40 tons a year. I think one of these, the modification
9 itself led to an increase in emissions of 20,000 tons a year.
10 So these are very significant violations.

11 **Q.** And what time period did these violations occur?

12 **A.** The ones identified here, I believe it says from the mid
13 '80s, early '80s to the early '90s.

14 **Q.** And were they considered continuing violations by USEPA?

15 **MS. GILLEN:** Objection, Your Honor. This, too, is
16 also a legal issue that is ongoing in many courts, and
17 specifically with regard to TVA's plans that are addressed
18 here, as has been decided by courts of appeals in TVA's
19 favor.

20 **THE COURT:** Overruled.

21 **THE WITNESS:** The EPA considered these to be
22 continuing violations because, while the obligation to get a
23 permit, pre-construction permit, could be argued to be a
24 one-day obligation with a maximum of \$5.7 thousand, what the
25 permit requires is to put on controls and to meet limits

1 thereafter, forever thereafter. EPA's view is that these
2 violations continue until today.

3 Q. So what's the implication of the emissions from these
4 units that were determined to be in violation of the New
5 Source Review provisions of the Clean Air Act, effective when
6 they were modified a number of years ago?

7 A. To give a long-ish answer, we had -- I mentioned the
8 heavy-duty diesel matters. At one point during that
9 investigation, we calculated the illegal emissions from that
10 activity industry-wide to be a million tons over the useful
11 life of those trucks, which would be 20 years or so. And we
12 were stunned.

13 Most air pollution enforcement matters, you know, if you
14 have a few hundred tons or a few thousand tons, it's a big
15 deal. The wood products industry that I mentioned earlier,
16 the excess emissions were in the range of several thousand
17 tons. Here, this utility alone has over a million tons of
18 what I would call excess, illegal emissions resulting just
19 from the identified violations set aside what I would assume
20 come out of an audit. So I would say this is one of the most
21 significant set of violations I've ever seen.

22 Q. And if TVA had complied with the New Source Review
23 provisions of the Clean Air Act and went through the
24 permitting at the time they did these major modifications,
25 they would have been required to put on additional controls?

1 Is that your testimony?

2 A. Yes, it is.

3 Q. And additional controls on NOx for the NOx violations?

4 A. Yes.

5 Q. And additional violation -- I'm sorry. And additional
6 controls on the sulfur dioxide, for the sulfur dioxide
7 violations?

8 A. Yes.

9 Q. And how would those controls that were required by the
10 Clean Air Act at the time these modifications were made
11 compare to the controls, additional controls, that North
12 Carolina is seeking in this case on these units?

13 A. I'd say they're comparable. However, I would also say
14 that, for instance, SO2 -- FGDs have been around since the
15 early '70s, but their performance has greatly improved over
16 time. So if TVA had put on SO2 controls, for instance, in
17 1986, you'd be in the 90s, 90 percent removal rate, where
18 today one would expect to see upper 90s from a new FGD. But
19 they're in the same, you know, range.

20 You would -- I would have expected, in the '80s, that an
21 FGD would have gotten 90 percent reduction from TVA's
22 emissions. With SCRs, it is more of an argument as to what
23 the control device would have been in the early '80s, but,
24 again, I think by the '90s, certainly, EPA would have
25 asserted that SCRs would be BACT in those days. In the early

1 days we're probably looking at 80 percent removal and now
2 we're looking at 90 percent removal. But, again, it would
3 have been a significant emission reduction. Even before SCR,
4 there were other techniques, such as over-firing air, that
5 would have had a substantial emission reduction, however, not
6 as great as an SCR would provide.

7 **Q.** Have you done an estimate of the unlawful emissions that
8 have been emitted from TVA's units summarized on Plaintiff's
9 Exhibit 378 that were determined by the USEPA to be out of
10 compliance with the Clean Air Act NSR requirements?

11 **MS. GILLEN:** Your Honor, I just lodge a continuing
12 objection to characterizing them as unlawful.

13 **THE COURT:** All right. Let the objection be shown
14 in the record and overruled by the Court.

15 **MR. GOODSTEIN:** Thank you, Your Honor.

16 **THE WITNESS:** 381 is not exactly as you
17 characterized it, Mr. Goodstein.

18 Exhibit 381 is a calculation of what the excess
19 emissions are, I would say, using today's BACT numbers as
20 opposed to what might have occurred historically. These
21 numbers, I think, are numbers that would have occurred if EPA
22 and TVA had resolved the matter some years ago, in 2001, but
23 they probably -- some of these numbers are already aggressive
24 in terms of what NOx reductions, for instance, would have
25 been required in 1986.

1 Q. So can you identify Plaintiff's Exhibit 381 and explain
2 to us what it shows.

3 A. What 381 shows is a number of -- there are several
4 columns. Some of them are simple data supplied by EPA -- by
5 TVA to the EPA information system or from TVA's submissions
6 in this case. Dr. Staudt prepared this at my request.

7 They show in the different columns, one is what is the
8 NOx emissions reported by TVA for the class identified by the
9 EAB decision as violations of the NSR for NOx. And that's
10 the third column of numbers, the first column of real data.
11 80,292 tons of NOx were emitted in the year 2006 by the
12 listed facilities. And that's the information provided to
13 the government by TVA.

14 The heat input, again, is -- I'm not sure exactly what
15 it's derived from, but I assume it's arrived from the DOE
16 data. The .07 assumed NOx rate is what Dr. Staudt assumes as
17 a representative NOx emission rate if you would put on
18 controls for NOx today. I would say, in my opinion, that's a
19 reasonable limit.

20 It's a simple mathematical calculation to multiply the
21 heat input in mmBtu by the NOx rate of pounds per BTU, and
22 convert that to tons per year. And so we see that if TVA
23 were to install today's NOx controls, their NOx emissions,
24 leaving everything else the same, would drop from 80,293 tons
25 to 13,362 tons for these units, which is a reduction of some

1 60 to 70,000 tons a year.

2 Q. What's the last column over on the right?

3 A. Last column on the right is taking information from
4 Mr. Park's declaration as to what permit limit was supplied
5 to these particular units. And there you see the sum total
6 is 131,511 tons.

7 Q. What does that tell you when you compare that to the
8 actual emissions for 2006 for these units?

9 A. Well, for some of the units, acid rain program limits
10 apply. So some of those units, the permit limits are
11 constrained for TVA, but for many of the units, the permit
12 limits in no way constrained TVA's operation.

13 For instance, if you to look at Bull Run, their
14 emissions are 8,300 tons and their limit is 14,000 tons.

15 Q. Okay. Let's take a look at Plaintiff's Exhibit 382 for
16 identification, and can you identify that and explain to us
17 what it shows.

18 A. This is pretty much the same information but with
19 respect to SO2 emissions and the plants identified in the EAB
20 decision as violations of NSR with respect to SO2.

21 And here we see that the reported annual emissions from
22 the named facilities is 76,000 tons, 76,173 tons, and if
23 those facilities were installed with sulfur control devices
24 at today's reasonable levels, that 76,000 tons would drop to
25 11,300 tons.

1 Q. All right. And what does this show about the permit
2 limits for sulfur dioxide for these units that were
3 determined by the EAB to be out of compliance with the Clean
4 Air Act?

5 A. The Title IV program does have facility-specific limits
6 for NOx, but it doesn't have similar limits for SO2. So here
7 you see that TVA's permit limits are relics of the early
8 1970s and they in no way constrained TVA's operations.

9 Q. And was the audit, the system-wide audit, for NSR
10 violations that was requested by USEPA Region 4 in the
11 administrative order that we've just looked at, to your
12 knowledge, was that audit ever completed?

13 A. To my knowledge, no.

14 Q. And what does that tell you, based on your experience
15 with this investigation of TVA?

16 A. Well, two or three things here.

17 One, the laws of physics apply to all of TVA's plants.
18 Most of these plants -- many of these plants were built in
19 the '40s and '50s. One can expect that these large
20 components will wear at essentially the same rate.

21 Two, we saw in Mr. Park's materials that TVA had
22 expended -- had capital expenditures for a number of years
23 for pollution control projects in response to the 1970's era
24 lawsuits against TVA. But then, for a long period of ten
25 years or more, no capital expenditures are reported. And the

1 reason that this is significant is one can modify -- you can
2 modify your plant and make a physical change, including
3 replacing these big boxes, as long as your emissions don't go
4 up. And so one way to manage the process is to time your
5 large capital projects with installation of pollution control
6 devices.

7 And so one might wonder, you know, is there a violation
8 here. If pollution control projects are being installed at
9 the same time or during a time frame, you'd have to at least
10 think that, well, there may not be violations because there
11 are emission investments going on.

12 **MS. GILLEN:** Your Honor, I'd like to interpose an
13 objection to this testimony. It's clearly speculative.
14 Mr. Buckheit is speculating as to what TVA has or has not
15 done. I don't think he knows.

16 **THE COURT:** I'll sustain that objection.

17 **MR. GOODSTEIN:** Thank you, Your Honor.

18 **BY MR. GOODSTEIN:**

19 **Q.** Mr. Buckheit, I'd like to show you what's been
20 identified as Plaintiff's Exhibit 380 and ask you if you can
21 identify that document and tell us what it shows.

22 **A.** 380 is the same information as in the earlier two sets
23 of calculations but looking at TVA's entire system, not just
24 the units where we had specifically identified violations.

25 **Q.** And what does it show?

1 A. If I can get to the fine print.

2 The system-wide emissions from TVA, all of TVA's units
3 in 2006, 452,791 tons of SO2. If BACT levels or controls
4 were employed at each of those units, those emissions would
5 drop by approximately 345,000 tons to something -- to 78,508
6 tons per year.

7 Similarly, TVA's NOx emissions in 2006 were
8 197,843 tons; and if today's level of NOx controls were
9 applied to each of the units in TVA's system, emissions would
10 drop from that 197,000 tons to 36,637 tons.

11 Q. So what's the significance of these summaries, based on
12 your experience with investigations of TVA?

13 A. Well, if TVA had violation rates across its system that
14 were similar to other systems that we looked at, then one
15 might expect that the, quotes, unlawful, close quotes,
16 emissions, for instance, of SO2 would be in the range of
17 350,000 tons a year. Excuse me. 300,000 tons a year. The
18 net is 350. And if we assume 70 or 80 percent of
19 350,000 tons a year, we would be at 300,000 tons a year.

20 Similarly, if we look at NOx, the reduction for all
21 units applying BACT is 100 -- looks like 160,000 tons. If we
22 apply a 70 or 80 percent estimate of violations that were
23 similar to what we found at other systems to that number, we
24 would get something like 130,000 tons per year over a 15-year
25 period with BACT for however long these continue.

1 Q. Mr. Buckheit, you were retained by North Carolina in
2 this case to look at some of the expert reports disclosed by
3 TVA and to reach some conclusions about that?

4 A. Yes.

5 Q. Can you give us an overview of what conclusions you
6 provided in your expert disclosure report in this case?

7 A. There were four areas --

8 MS. GILLEN: Your Honor, I'd like to re-up our
9 objection. Mr. Buckheit is an attorney and he has been
10 listed on North Carolina's expert stipulations and
11 qualifications as his area of expertise being Clean Air Act
12 implementation, including TVA's history of non-compliance of
13 air pollution requirements, which I do not believe
14 encompasses the setting of NAAQS, the efficacy of NAAQS.

15 Mr. Buckheit is not a toxicologist or an
16 epidemiologist. He is an attorney who was charged with
17 enforcement of policies set by other people at the EPA.

18 MR. GOODSTEIN: Your Honor --

19 THE COURT: Let me hear from you on that,
20 Mr. Goodstein.

21 MR. GOODSTEIN: Thank you, Your Honor.

22 We've laid some foundation for this. We've looked
23 at the description of Mr. Buckheit's job at the EPA. He
24 described it as a policy job. It's described in the
25 description, current description of position of Air

1 Enforcement Director as a policy job.

2 We also heard testimony from Mr. Buckheit about his
3 experience on the Virginia Air Quality Control Board,
4 implementing the Clean Air Act and administering the Clean
5 Air Act, including the NAAQS.

6 There is testimony that is going to be proffered by
7 TVA on this, Your Honor, and that includes a former EPA
8 official, Dr. Anderson, and she is going to testify about her
9 knowledge and experience with the National Ambient Standards
10 under the Clean Air Act, and her background and experience
11 with it is very similar to the background and experience that
12 Mr. Buckheit brings to it.

13 Dr. Anderson has a pedigree in toxicology.
14 Mr. Buckheit has a pedigree in physics. He also has a law
15 degree. But, Your Honor, just because he has a law degree
16 doesn't mean all the conclusions he reaches in the area of
17 Clean Air Act implementation and administration is a legal
18 conclusion. He is offering the same type of opinion that
19 Dr. Anderson is offering. And North Carolina should be
20 entitled to have an expert on implementation of the NAAQS who
21 has got experience both at the federal level, implementing
22 it, and at the state level, the same way TVA has an expert on
23 implementation of the NAAQS, who was also a former official
24 at EPA.

25 **MS. GILLEN:** Your Honor, if I may. First of all,

1 I'd like to comment that this testimony is cumulative, and
2 North Carolina has already brought on Dr. Levy, who has
3 testified.

4 Second of all, Mr. Buckheit's experience at the EPA
5 is in a different world from Dr. Andersen's experience at
6 EPA. Dr. Anderson was responsible for setting the standards,
7 the air quality standards that we're talking about that are
8 reflected in the NAAQS, and she's led hundreds of risk
9 assessments in order to set those standards. So their
10 experience and their qualifications are worlds apart.

11 **MR. GOODSTEIN:** Your Honor, we can lay some further
12 foundation on Mr. Buckheit's experience under the NAAQS
13 program. It's explained to some extent in his CV and in his
14 description of the position, the Director of Air Enforcement
15 Division, 458A. But we can also lay some further foundation
16 with him to follow up on the description of his experience at
17 the Virginia Air Quality Control Board, which, as
18 Mr. Buckheit testified earlier, is the authority in the
19 Commonwealth of Virginia that sets air quality standards in
20 that state. So he's got experience with both --

21 **THE COURT:** I have no problem with his testimony
22 and his opinion in compliance with his duties and
23 responsibilities in these various positions, that they
24 weren't in compliance.

25 I do have a problem here, for example, with this,

1 what you you're proposing, summary opinion, 17,000 fatalities
2 per year from excess emissions. Those are things that your
3 experts have already talked about, and I don't think
4 Mr. Buckheit proposes to have expert knowledge in that area
5 as a part of his expert report that you're putting together
6 here.

7 **MR. GOODSTEIN:** Well, Your Honor, we are just going
8 to ask Mr. Buckheit some questions about the National Ambient
9 Air Quality Standards program, as I described.

10 **THE COURT:** I think that I'm going to sustain the
11 objection at this point. If after hearing TVA's evidence, if
12 I think it might be proper for rebuttal purposes, then I'll
13 let you know.

14 **MR. GOODSTEIN:** All right. Thank you, Your Honor.

15 **MS. GILLEN:** Thank you, Your Honor.

16 **THE COURT:** Yes.

17 **MR. GOODSTEIN:** Your Honor, there is also a portion
18 of Mr. Buckheit's disclosure that addressed the opinions of
19 Gordon Park, who is a witness for TVA who is going to testify
20 that, based on his review, TVA is in substantial compliance
21 with the Clean Air Act; and I was planning on asking
22 Mr. Buckheit whether he, upon review of Mr. Park's report,
23 his knowledge of TVA's history of non-compliance with the
24 Clean Air Act, whether he agrees with those opinions, and, if
25 not, why.

1 So I'm not sure if that's part of your ruling, Your
2 Honor, or if I can proceed with that line of questioning.

3 **MS. GILLEN:** Your Honor, TVA intends to call
4 Mr. Park in its direct case and, presumably, will be able to
5 be cross-examined by North Carolina.

6 **THE COURT:** Yes. I will sustain that part of it
7 also and he may come back later. At this point I'm
8 considering it objectionable.

9 **MR. GOODSTEIN:** Thank you, Your Honor.

10 If I could have a moment to consult with counsel
11 before I pass the witness.

12 **(Pause in the proceedings.)**

13 **MR. GOODSTEIN:** Your Honor, at this time we offer
14 Plaintiff's Exhibits 436, 458A, 378, 379, 381, 382, and 380
15 into evidence.

16 **MS. GILLEN:** Your Honor, TVA just notes for the
17 record its objection to -- let me get the right numbers --
18 377, 378, 379, 381, 382 and 380 as being based on allegations
19 of an administrative compliance order that was deemed to be
20 without legal consequence by the Eleventh Circuit Court of
21 Appeals.

22 **THE COURT:** Again, the objections are overruled.

23 **MR. GOODSTEIN:** Thank you, Your Honor.

24 **(Plaintiff's Exhibits 788-382, 436 and 458A**
25 **received.)**

1 **MR. GOODSTEIN:** We have no further questions of
2 Mr. Buckheit at this time, Your Honor.

3 **THE COURT:** All right. Who is going to
4 cross-examine?

5 **CROSS EXAMINATION**

6 **BY MS. GILLEN:**

7 **Q.** Good morning, Mr. Buckheit.

8 **A.** Good morning.

9 **Q.** If I could ask you before we start, just to save
10 confusion in the middle, if you could pull out TVA's exhibit
11 book No. 23, which is on the rolling cart to your left there.

12 Thank you.

13 I think we've established this but, just for the record,
14 Mr. Buckheit, you are an attorney, correct?

15 **A.** I am an attorney.

16 **Q.** And you are not a toxicologist?

17 **A.** I am not a toxicologist.

18 **Q.** And you are not an epidemiologist?

19 **A.** I am not an epidemiologist.

20 **Q.** You are an attorney. Correct?

21 **A.** I am.

22 **Q.** And as an attorney, you were involved in the development
23 of cases referred to the Department of Justice for
24 prosecution for alleged violations of the New Source Review
25 requirements of the Clean Air Act, correct?

1 A. That's correct.

2 Q. And in your opinion -- and your opinion is that, based
3 on EPA's investigation, it appears that as much as 70 to
4 80 percent of the entire utility industry has been violating
5 New Source Review.

6 A. I missed a word there. Could you just say it again?

7 Q. Sure. And it's your opinion that, based on EPA's
8 investigation that you spearheaded, as much as 70 to
9 80 percent of the entire utility industry was violating New
10 Source Review; is that correct?

11 A. Yes.

12 Q. And one of the cases that you helped develop for
13 prosecution involved Duke Energy, right?

14 A. That's correct.

15 Q. And the EPA alleged that certain projects undertaken by
16 Duke Energy at 29 of its units here in North Carolina
17 violated New Resource Review.

18 A. That's correct.

19 Q. And I believe you testified that under the Clean Air
20 Act, if such violations are proven, the offending utility
21 must install best available control technology, which is
22 abbreviated as BACT sometimes.

23 A. That's correct.

24 Q. And I believe you further testified that BACT for SO2
25 emissions is an FGD or scrubber?

1 A. For most of it.

2 Q. And you said, although there's some question, generally,
3 BACT for NOx emissions is an SCR.

4 A. Today.

5 Q. And North Carolina was aware of EPA's allegation that
6 Duke had violated New Source Review at 29 of its units,
7 correct?

8 A. Yes.

9 Q. And North Carolina has not independently investigated
10 those claims.

11 A. To my knowledge, they have not.

12 Q. But in your opinion, your personal opinion, Duke Energy
13 did violate New Source Review at each of these 29 units.

14 A. That's correct. And the federal government filed a
15 lawsuit.

16 Q. And in your opinion, Duke Energy is operating each of
17 these units today, in violation of the Clean Air Act.

18 A. Yes.

19 Q. North Carolina has not filed suit against Duke for those
20 alleged New Source Review violations, have they?

21 A. No, they haven't.

22 Q. One of those 29 projects occurred at Duke's Buck plant,
23 Unit 5, specifically?

24 I can refer you to an exhibit if you'd like.

25 A. I don't recall the names of each unit.

1 Q. Let me try to make it easier. Why don't you turn in
2 your exhibit book 23 to Defendant's Exhibit 517. And this is
3 an excerpt from a decision of the United States District
4 Court for the Middle District of North Carolina captioned
5 *United States vs. Duke Energy Corporation*.

6 And as I said, it's just an excerpt. I can provide you
7 with the whole opinion if you'd like. But I would
8 specifically turn your attention to page 2, which is page 624
9 of the reported decision, and to the footnote No. 2 that
10 appears on that page.

11 A. I see it.

12 Q. And does that refresh your recollection that one of the
13 29 projects that EPA accused Duke of being in violation of
14 the New Source Review occurred at Duke's Buck plant Unit 5?

15 A. I'll accept that we sued Buck Unit 5.

16 Q. And Duke does not plan to put a scrubber on Buck Unit 5
17 in order to comply with the North Carolina Clean Smokestacks
18 Act, does it?

19 A. I don't know.

20 Q. I'd like to show you an excerpt from what has been
21 admitted into evidence as Plaintiff's Exhibit 10. And we'll
22 put that on the monitor for you.

23 MS. GILLEN: There we go. Okay. Great.

24 This is the cover page of Plaintiff's Exhibit 10.
25 If you would please put the next page up. That's the page we

1 need to look at. We just need the left-hand columns.

2 There we go. Great.

3 **BY MS. GILLEN:**

4 **Q.** I represent to you that this was -- this is the latest,
5 most recent filing under the North Carolina Clean Smokestacks
6 Act, and these are Dukes plans for compliance with the CSA.
7 And if you will look to the facility list on the left, and
8 then on the third column over, it shows the technology that
9 is being planned.

10 And so my question, based on this recent filing, was
11 Duke does not plan to put a scrubber on Buck Unit 5 in order
12 to comply with the Clean Smokestacks Act, does it?

13 **A.** Well, I've never seen this document before, and I'll
14 just take it for what it says. It appears to say there's not
15 a listed scrubber for Buck Unit 5.

16 **Q.** Then referring back to the *United States v. Duke Energy*
17 opinion, another one of the 29 projects that EPA alleged
18 violated New Source Review occurred at Duke's Buck plant Unit
19 4; is that correct?

20 **A.** That's correct.

21 **Q.** And looking at Plaintiff's Exhibit 10, which has been
22 admitted into evidence, there is no scrubber planned for Buck
23 Unit 4, is there?

24 **A.** No. It looks like they plan to shut Buck Unit 4 down.

25 **Q.** And a third project of the 29 projects that EPA alleged

1 violated New Source Review occurred at Duke's Dan River Unit
2 3?

3 A. I see that.

4 Q. And looking at Plaintiff's Exhibit 10, there's no
5 scrubber planned for Dan River 3, is there?

6 A. That's what this document would appear to show.

7 Q. And another few of the 29 projects occurred at Duke's
8 River Bend plant, Unit 4, 5, 6 and 7. Is that correct?

9 A. I'm sorry. I don't see River Bend 5.

10 Q. You're quite right. I misspoke. I have 4 dash 7 on
11 mine. So let's be clear, 4, 6 and 7.

12 A. That's correct.

13 Q. Okay. Thank you for correcting me.

14 And if we look at Plaintiff's Exhibit 10, no scrubber is
15 planned for 4, 6 and 7 at Duke's River Bend plant; is that
16 correct?

17 A. I'm sorry. Would you just repeat that?

18 Q. Sure. Looking at Plaintiff's Exhibit 10, it appears
19 that no, Duke is not planning to install a scrubber on River
20 Bend Units 4, 6 or 7?

21 A. At whatever date this document is, that was apparently
22 not their plan.

23 Q. Right. It was June, 2008.

24 And if EPA's ongoing suit against Duke succeeds, Duke
25 will be required to include best available control technology

1 when it's -- in the operating permits of the implicated
2 plans, correct?

3 A. Yes.

4 Q. The North Carolina Clean Smokestacks Act does not
5 require Duke to include such limits in its operating permits,
6 though, does it?

7 A. No. The North Carolina act is a cap.

8 Q. In addition to Duke Energy, you developed cases against
9 other utilities, I believe you testified, and one of those
10 other utilities was Synergy. Is that correct?

11 A. That's correct.

12 Q. And under your direction, EPA enforcement sued Synergy
13 for alleged New Source Review violations at several of its
14 electric generating plants in Indiana and Ohio, correct?

15 A. That's correct.

16 Q. And by the time the case was given to the jury, the
17 original allegation that EPA had lodged had been discarded
18 and was down to 14 projects, correct?

19 A. I don't know.

20 Q. Okay. Let me show you -- just one second, I'll show you
21 something. I'm showing you now -- zoom out.

22 This is a jury verdict form. You can see the caption
23 there, "*United States vs. PSI Energy and Cincinnati Gas and*
24 *Electric Company, Better Known As Synergy*," and this is the
25 14 projects that went to a jury.

1 If you could just flash through the pages. This is page
2 one. You see two projects there, two for the defendant, one
3 for the plaintiff. Second page is three for plaintiff. And
4 the remaining projects are all found for defendant. There's
5 that court stamp at the top.

6 If you'll trust my math, I will represent to you that
7 the checkmarks add up to 14 total projects, 10 of which were
8 decided in the favor of synergy.

9 Does that appear to about what this court document
10 shows?

11 **A.** I'll rely on your math.

12 **Q.** Okay. New Source Review allegations against TVA's Bull
13 Run plant are still ongoing, aren't they?

14 **A.** I believe so.

15 **Q.** And the court that is hearing those allegations has not
16 decided that TVA broke the law in any way, has it?

17 **A.** I don't think it's rendered a decision, if that's your
18 question.

19 **Q.** Excuse me?

20 **A.** Is your question has it rendered a decision? I don't
21 think so.

22 **Q.** Correct. It has not rendered a decision yet, has it?

23 **A.** No.

24 **Q.** And you're aware from the testimony that TVA has an SCR
25 in its Bull Run plant and will be starting up a scrubber

1 later this year?

2 A. I don't -- I mean, I'm not going to quarrel with you. I
3 heard representations that they're planning on starting up an
4 FGD. As to whether there is an SCR, I'd have to look at a
5 piece of paper, but I'm not going to challenge it.

6 Q. Appreciate that. And the New Source Review allegations
7 against Unit 5 at TVA's Colbert plant were brought in a suit
8 filed some 20 years after the events at issue, and they were
9 dismissed by the District Court in the Northern District of
10 Alabama, correct?

11 A. I believe so.

12 Q. And that dismissal was affirmed by the Eleventh Circuit?

13 A. Yes. That was a citizen suit, not a --

14 Q. Right, and that was --

15 A. That was the basis, as I understand it, for dismissal.

16 Q. I'm sorry?

17 A. I think that was the basis for the dismissal, was the
18 status of the plaintiff, not the ongoing violation.

19 Q. Actually, no; it was that they were untimely, untimely
20 brought.

21 A. That -- not to argue with you, but that wouldn't apply
22 to the government.

23 Q. I'm sorry. I can't understand.

24 Well, for whatever reason, you can testify that the
25 Eleventh Circuit affirmed the dismissal of that case against

1 TVA?

2 A. The document is a better record on that, but it's my
3 general understanding that's what occurred.

4 Q. Okay, great. And the petition for certiorari that the
5 citizen group brought in that case was denied by the United
6 States Supreme Court, was it not?

7 A. I don't know that. Either way.

8 Q. Let me show you...

9 A. I see that.

10 Q. Thank you.

11 And in addition to the other cases, you were directly
12 involved as an attorney in the development and prosecution of
13 the EPA enforcement action against TVA, correct?

14 A. Correct.

15 Q. And that prosecution was described by the Eleventh
16 Circuit as lacking the virtues of most agency adjudications,
17 correct?

18 A. The EAB hearing?

19 Q. Yes.

20 A. That's correct.

21 Q. And the Eleventh Circuit found that the basis of EPA's
22 case against TVA was not divulged to TVA until three weeks
23 before the administrative --

24 **THE COURT:** Can we shorten this by just introducing
25 the Eleventh Circuit opinion and move along?

1 **MS. GILLEN:** Oh, okay, Your Honor. Sure.

2 Well, we have as an exhibit Defendant's Exhibit
3 518, which is an excerpt from that decision, which is
4 recorded at 336 F.3d, page 1236.

5 **THE COURT:** All right. Let that be admitted.

6 **(Defendant's Exhibit No. 518 received**
7 **in evidence.)**

8 **BY MS. GILLEN:**

9 **Q.** EPA has never proven the existence of the allegations
10 against TVA in district court, has it?

11 **A.** It has not.

12 **Q.** In fact, no court anywhere has ever held TVA violated
13 any Clean Air Act New Source Review requirements, has it?

14 **A.** That's true. However, numerous district courts have
15 found similar modifications to be violations of the New
16 Source Review rule, and those courts -- I'm thinking now of
17 the Duke court -- held otherwise have been reversed by the
18 Supreme Court.

19 **Q.** But my question --

20 **A.** I answered it. I said I agree.

21 **Q.** -- was, no court has ever found TVA has violated the New
22 Source Review?

23 **A.** That's correct.

24 **MS. GILLEN:** Thank you very much, Mr. Buckheit.

25 No further questions, Your Honor.

1 **THE COURT:** Mr. Goodstein?

2 **REDIRECT EXAMINATION**

3 **BY MR. GOODSTEIN:**

4 **Q.** Mr. Buckheit, was this case against TVA pursued
5 judicially by the USEPA?

6 **A.** No.

7 **Q.** And why not?

8 **A.** Without getting too deeply into interdepartmental
9 matters, the Justice Department has publicly announced
10 several times that it believes in -- its term -- the unitary
11 executive theory, in which executive branch agencies should
12 not utilize the services of the court system to resolve
13 disputes, and so agencies should not sue agencies.

14 **Q.** So what you're saying is EPA, through the Justice
15 Department, determined that it couldn't proceed judicially
16 against TVA because of TVA's status?

17 **A.** I think it's more a policy statement than a legal bar,
18 and, as a policy statement, that's subject to change, but
19 that has been the policy of the Justice Department on this
20 matter.

21 **Q.** Was there any determination, to your knowledge, by the
22 Justice Department or EPA that the violations determined by
23 EPA were unfounded?

24 **A.** Absolutely not. The Justice Department reviewed each of
25 the allegations contained in the EPA administrative order.

1 They were pursuing similar violations elsewhere, and I
2 certainly wanted to assure that we were being consistent in
3 each of the forums that we were proceeding.

4 In addition, shortly after the change of administration,
5 the Cheney Energy Task Force asked a different office within
6 the Department of Justice, the Office of Legal Counsel, to
7 review the theories that were being pursued by the government
8 in these New Source Review matters, and the LLC report was
9 that theories were sound.

10 Q. Does TVA share the unitary executive theory with the
11 Department of Justice?

12 A. On their pleadings, no.

13 Q. In fact, did they sue EPA in this case, *EPA vs. Whitman*,
14 which they just offered into evidence?

15 A. Yes.

16 Q. And did the Court of Appeals there determine that they
17 lacked jurisdiction to review the ACL because it didn't
18 constitute final agency action?

19 A. Yeah, the Court didn't review the substance of the
20 administrative decision.

21 MR. GOODSTEIN: If I could have a moment, Your
22 Honor.

23 THE WITNESS: Excuse me, the EAB order.

24 BY MR. GOODSTEIN:

25 Q. Is EPA the agency entrusted by Congress to implement the

1 Clean Air Act?

2 **A.** Yes, it is.

3 **MR. GOODSTEIN:** We have no further questions of
4 Mr. Buckheit, Your Honor.

5 **THE COURT:** All right. Thank you, Mr. Buckheit.
6 That will complete your testimony.

7 We'll take a 15-minute midmorning recess.

8 **(Recess.)**

9 **THE COURT:** Mr. Goodstein?

10 **MR. GOODSTEIN:** Thank you, Your Honor.

11 North Carolina's next witness is Dr. Susan Tierney.

12 **SUSAN TIERNEY,**
13 **being duly sworn, was examined and testified as follows:**

14 **DIRECT EXAMINATION**

15 **MR. GOODSTEIN:** Your Honor, if I may approach, we
16 have a binder for the Court for Dr. Tierney's exhibits.

17 **THE COURT:** All right. Thank you.

18 **MR. FINE:** Before Mr. Goodstein gets started, Your
19 Honor, if I could just indicate to the Court and to counsel
20 that TVA would be willing to stipulate to Dr. Tierney as an
21 expert in utility economics and financial analysis, as
22 denominated in the plaintiff's filing in this case in their
23 qualifications of their experts.

24 **THE COURT:** All right. Let the record reflect the
25 stipulation.

1 **MR. GOODSTEIN:** Thank you, Your Honor.

2 **BY MR. GOODSTEIN:**

3 **Q.** Can you state your full name for the record,
4 Dr. Tierney?

5 **A.** My name is Susan Fallows Tierney.

6 **Q.** And how are you involved in this case, Dr. Tierney?

7 **A.** I am here testifying on behalf of the State of North
8 Carolina.

9 **Q.** Okay. And what were you asked to look at on behalf of
10 North Carolina?

11 **A.** I was asked to look at whether or not the Tennessee
12 Valley Authority would be capable of undertaking an
13 investment program to put in place pollution control
14 equipment as recommended by the State of North Carolina.

15 I was asked specifically to opine on whether or not the
16 program, as proposed, would be financially feasible and
17 financially reasonable for TVA to undertake.

18 **Q.** And did you reach any conclusion on those questions?

19 **A.** Yes, I did.

20 **Q.** And what was your overall conclusion?

21 **A.** My overall conclusion was that, indeed, it would be
22 financially feasible and reasonable for the Tennessee Valley
23 Authority to undertake the pollution control equipment
24 program as recommended by the State of North Carolina.

25 **Q.** And you prepared several disclosure reports in this

1 case, Dr. Tierney?

2 **A.** I did.

3 **Q.** They should be at the back of your binder, marked for
4 identification as Plaintiff's Exhibits 481 and 482.

5 Can you take a moment and look at those and see if
6 they're true and accurate copies of your reports, and if so,
7 let us know.

8 **A.** They look like it to me.

9 **Q.** Your Honor, at this time we offer Plaintiff's Exhibit
10 481 and 482 into evidence.

11 **MR. FINE:** Your Honor, we have no objection, but I
12 have a couple questions for counsel, if he would indulge me.

13 When Dr. Tierney submitted her initial expert
14 report, which has been offered for evidence as Plaintiff's
15 Exhibit 481, there was a sort of a supplement to her expert
16 report that contained confidential information, information
17 denominated as confidential by TVA, and my concern is if that
18 portion of her initial report is being tendered as
19 Plaintiff's Exhibit 481. We would ask that that particular
20 portion be filed under seal under the terms of the protective
21 order which the Court has entered in this case.

22 **THE COURT:** Yes. If you will designate that
23 portion of which you want filed under seal, the Court will
24 order that be done in the filing of these reports.

25 **MR. FINE:** Your Honor, I'm actually seeking some

1 assistance from my worthy opposing counsel because I do not
2 see that document in the materials. And if I could have a
3 representation, counsel, if that's not part of the rather
4 long document that we're looking at as Plaintiff's 481, I
5 believe that the problem will take care of itself.

6 **MR. GOODSTEIN:** I don't believe it's a part of
7 that.

8 **THE COURT:** Not a part?

9 **MR. GOODSTEIN:** Not a part.

10 **MR. FINE:** Then, Your Honor, we're fine and can
11 proceed.

12 **THE COURT:** All right. Let those two reports be
13 admitted. That's 481 and 482.

14 **(Plaintiff's Exhibit 481 and 482 received.)**

15 **BY MR. GOODSTEIN:**

16 **Q.** Dr. Tierney, I'm going to refer you back to the first
17 exhibit in your binder, Plaintiff's Exhibit 435 for
18 identification. Is that a copy of your CV?

19 **A.** Yes, it is. At least as it stood at the time I filed my
20 original report.

21 **Q.** Can you give us a summary of the updates that are
22 included on your current CV?

23 **A.** Yes. There are an additional half dozen testimonies.

24 On page 50 of this exhibit -- it's actually not page 50.
25 It's the third page of the exhibit.

1 Q. Right. But it was at the end of your report, so it's
2 got those page numbers. But that's okay. That's easier to
3 direct us.

4 A. I just didn't want people to think I was giving you a
5 50-page resume.

6 Q. We understand.

7 A. Page 50 shows that I had a number of testimonies since
8 the year 2000. There are approximately a half dozen other
9 testimonies filed in courts or administrative agencies.

10 Additionally, there are approximately maybe ten reports
11 or articles that I have authored or co-authored, and those
12 would appear to supplement those that are listed on pages 52
13 and 53.

14 And additionally, I have been involved in a number of
15 other industry panels. Therefore, those would supplement the
16 other professional activities that are listed beginning on
17 page 53.

18 Q. Okay. And what is your current position, Dr. Tierney?

19 A. My current position is managing principal at a
20 consulting firm called Analysis Group, Inc.

21 Q. And what do you do in that position?

22 A. I am a full time consultant involved on a number of
23 engagements for public and private clients, principally on
24 matters involving the electric industry and the natural gas
25 industries, but other utility industries as well.

1 Q. And how long have you been involved in issues related to
2 the electric power markets and utility regulation policy in
3 that sector?

4 A. For approximately 25 years.

5 Q. And who are some of your clients in your current
6 practice?

7 A. I have a wide variety of clients. On the one hand, I
8 work for utility companies on matters of strategy or matters
9 of rate regulation. I have worked for large industrial
10 customers as they've tried to figure out a strategy for using
11 a variety of energy sources in a clean and efficient fashion.

12 I have worked for a number of organizations that are
13 called regional transmission organizations. They're the grid
14 operators. And I work with the boards of directors and
15 senior management on a number of strategic issues involving
16 the design of the markets and the market rules, as well as
17 some of the key issues facing those organizations.

18 I have worked for a number of public organizations,
19 including state governments, on matters such as this.

20 That gives you a range of the type of client work that
21 I've done on electric and gas industry issues.

22 Q. And can you summarize for us your educational background
23 and your professional experience?

24 And I know this is listed on page 49 of your CV, but if
25 you could just give us an overview of your educational

1 background and professional experience, please.

2 A. I have a bachelor's degree from 1973 from a college in
3 California called Scripps College. After that, I undertook a
4 master's degree and a Ph.D., both in regional planning.
5 Regional planning is an area of -- it's a discipline that
6 involves analyzing public and private sector problems. My
7 specialty was on infrastructure issues and analyzing issues
8 at the intersection of economics, in some sense engineering,
9 politics, and administration; and, specifically, what I mean
10 is kind of the conduct of developing energy systems,
11 developing transportation systems and water systems.

12 Oh, that's my education.

13 My professional experience. After receiving my Ph.D., I
14 taught at the University of California for a number of years,
15 and subsequently resigned that in order to practice in my
16 discipline.

17 I went to Massachusetts, where I was involved in a
18 number of government jobs in state government, starting with
19 a position in the state's energy office, where I served as a
20 senior economist involved principally on electric industry
21 issues.

22 After that, I became the director of the State Energy
23 Facilities Siting Council, the organization that is involved
24 and responsible for approving electric and gas utility demand
25 forecasts and plans to supply resources to their consumers,

1 as well as their proposals to construct power lines, gas pipe
2 lines, and power plants.

3 I served in that position a number of years and was
4 appointed by Governor Dukakis to serve as commissioner on the
5 state's public utility commission. That's the rate-setting
6 agency that approves financings, rates, and a number of other
7 issues involved in the investor-owned utility sector
8 electric, gas, telephone and water utilities.

9 After that service for a number of years, I was
10 appointed by Governor Weld to serve as the Secretary of
11 Environmental Affairs. I was responsible for natural
12 resource management, as well as pollution control in the
13 Commonwealth of Massachusetts.

14 One of my prime responsibilities was to serve as the
15 chairman of the board of the Massachusetts Water Resources
16 Authority. The Secretary of Environmental serves -- excuse
17 me. The Secretary of Environmental Affairs always serves as
18 the chairman of the board of the Massachusetts Water
19 Resources Authority. That is a public authority, a
20 multibillion-dollar agency charged with providing clean water
21 and sewer services in the eastern half of Massachusetts.
22 It's the agency that was responsible for implementing the
23 court-ordered cleanup of Boston Harbor. So for three years,
24 I served as the chair of the board for bi-weekly meetings at
25 which we oversaw a multibillion-dollar program to clean up

1 Boston Harbor, as overseen by Federal Judge David Mazzone.

2 From that position, I was appointed Assistant Secretary
3 of Policy at the U.S. Department of Energy, appointed by --
4 nominated by President Clinton and appointed by -- excuse
5 me -- confirmed by the U.S. Senate. My responsibilities at
6 the Department of Energy were to be involved in matters
7 related to energy policy of the U.S. government. I was the
8 principal policy adviser to the Secretary of Energy.

9 Additionally, I was involved in strategic planning for
10 the Department of Energy. At the time, it was approximately
11 a \$20 billion organization. I was responsible for nuclear
12 warheads, clean up of contaminated lands from testing of
13 nuclear warheads, the Advanced Energy Research and
14 Development Program of the United States government, and
15 occasionally some energy policies as well.

16 Q. So --

17 A. I --

18 Q. Oh, I'm sorry.

19 A. That's great.

20 Q. In your work for the Commonwealth of Massachusetts and
21 the U.S. government, have you evaluated the economic
22 feasibility of utility programs?

23 A. Yes.

24 Q. Can you describe that experience for us?

25 A. Yes. Let me describe most directly two things, both of

1 which were in Massachusetts. One of them was the work that I
2 was involved with as a commissioner of the Department of
3 Public Utilities. In Massachusetts, the state has
4 responsibility to set the rates of the utility companies. No
5 rate can be charged by utility companies other than those
6 that are approved by the state commission. We approved
7 demand forecasts, supply plans. These are large utility
8 companies providing service in the franchise areas in -- as
9 established under state law and policy.

10 We had authority to review and approve issuances of
11 security and large debt instruments by the utilities under
12 our jurisdiction.

13 Additionally, as part of responsibility for approving
14 contracts, approving cost recovery for multimillion-dollar
15 and, in some cases, hundreds of millions of dollars of
16 investment in utility power plant and transmission
17 investment.

18 As I mentioned, as Chairman of the Board of the Water
19 Resources Authority, I was involved in actually setting the
20 rates for providing water and sewer service in Massachusetts
21 for the wholesale sale of water and sewer services. That
22 organization, in some sense, was akin to the Tennessee Valley
23 Authority in the sense that it was a publicly-owned
24 authority; it had responsibility to set its own rates under
25 the board of directors' responsibility; it issued bonds and

1 other debt instruments; and was responsible for complying
2 with a significant major, multiyear -- actually, I think it
3 was a 15-year court-ordered compliance schedule for cleaning
4 up Boston Harbor. I believe the overall program that took
5 place in the 1980s and 1990s amounted to approximately
6 \$4 billion. And remember, that was two-decades-ago dollars.

7 Q. After your government service, you were in the
8 consulting business for a number of years, since
9 approximately 1995?

10 A. That's right.

11 Q. Can you describe the areas of your consulting practice,
12 please?

13 A. Yes. Yes.

14 I think there's three categories of work that I've been
15 involved with over the last 13 years in which I've been a
16 consultant. I described these a few minutes ago when I said
17 I advise companies on their business, on the environment in
18 which they are conducting their business and operations. I
19 advise them with regard to likely changes in regulatory
20 policy or market fundamentals, meaning fuel prices and other
21 issues. Those are engagements where I'm typically advising
22 senior management on matters that involve judgment as well as
23 very large sums of investment dollars for transmission, for
24 environmental compliance, for building power plants,
25 et cetera.

1 Another third or so of my work tends to involve writing
2 studies of policy issues in the electric industry, things
3 like the restructuring of the electric industry, how to
4 integrate market forces into certain parts of the electric
5 and gas industry to discipline prices. I have recently
6 published a number of those, most recently presented a report
7 that was commissioned by the organization of state officials,
8 state public utility commissioners. On Sunday, I presented a
9 report to them in which I analyzed how utilities around the
10 country use competitive procurements to figure out where to
11 obtain their next resources for their customers.

12 So that's about another third of my work, and that
13 involves electric and gas industry issues, in particular.

14 And then another third of my work I'd say is where I'm
15 involved as an expert witness on matters involving economics,
16 regulation, financial issues, utility rate-making for
17 electric and gas utilities. And I have done that in the
18 context of contracts disputes, tax board matters, matters of
19 rate-making before regulatory agencies, and litigation
20 involving some bankruptcy questions, where I have been an
21 expert on electric and natural gas industry matters.

22 Q. You said you testified on behalf of utilities in some of
23 those proceedings.

24 A. Yes, I have. Among others.

25 Q. All right. Have you written articles that have been

1 published in the literature in the field of utility economics
2 and financial analysis?

3 A. Yes, I have.

4 Q. And those are summarized in your CV --

5 A. Yes.

6 Q. -- starting at page 52.

7 A. Yes.

8 Q. And can you summarize your publications for us?

9 A. Yes. I tend to write on issues where there is a
10 question of either how to modify or revise regulatory policy,
11 or legislation in some cases, to accomplish one or another
12 efficiencies in the industry. So there are a number of
13 issues that I'm involved with where it has to do with
14 regulatory incentives.

15 I write also on issues related to things at the
16 intersection between environmental policy and economic policy
17 affecting the electric and gas industries.

18 I have done work on transmission issues, including
19 issues relating to how to allocate costs for electric
20 transmission among different kinds of customers.

21 I have done work on climate change policy and how it
22 might affect the electric industry. I have looked at the
23 benefits and costs of different kinds of organizational
24 structures in the electric industry, such as the adoption of
25 independent grid operators.

1 Q. Okay. And can you describe some of your professional
2 activities in the area of utility economics and financial
3 analysis, please.

4 A. There are several things that I am involved with
5 professionally. I periodically have been appointed to what
6 are called blue ribbon commissions or other industry
7 organizations having to do with transmission policy.

8 I'm a member of the National Commission on Energy
9 Policy, a bipartisan group that has been appointed, including
10 CEOs of major electric companies, as well as others,
11 including myself in academics, to opine on a number of
12 questions related to improvements in the nation's energy
13 policy.

14 I serve on the board of directors of several -- excuse
15 me. I have served on the board of directors of several
16 publicly-traded electric companies. Actually, I should
17 rephrase that. Publicly-traded companies who are involved in
18 the electric industry. They're not utilities. Some are
19 pollution control manufacturing companies. One is a power
20 production company that's called Renergy, and I now serve on
21 the board of that company.

22 Additionally, I serve on the board of directors of
23 several environmental, non-governmental organizations: The
24 Energy Foundation; The New England -- The Northeast States
25 for Coordinated Air Use Management Foundation; I serve on the

1 advisory counsel to a number of organizations such as the
2 National Renewable Energy Laboratory, a laboratory of the
3 U.S. government; the New York Independent System Operators,
4 on whose is environmental counsel I serve as a member.

5 In the past, I have served on the board of directors of
6 the electric industry's research and development consortium
7 called the Electric Power Research Institute and chaired its
8 subsidiary organization, which was called the Electricity
9 Innovations Institute.

10 There are several other things, but that's -- that gives
11 you a flavor.

12 **Q.** All right. We see you have a number of honors listed on
13 page 54 of your CV. Could you please summarize the
14 recognition you've received in your field as listed on your
15 CV?

16 **A.** Well, I was very proud to have received several awards
17 for my public service in state and federal government by the
18 Cogeneration Engineers Association and the Association of
19 State Energy Officials. And the "Energy Daily," which is an
20 industry newsletter.

21 **MR. GOODSTEIN:** At this time, Your Honor, we tender
22 Dr. Tierney as an expert in utility economics and financial
23 analysis.

24 I understand there is a stipulation.

25 **THE COURT:** Yes. Let the record show that the

1 Court so holds.

2 **MR. GOODSTEIN:** Thank you, Your Honor.

3 **BY MR. GOODSTEIN:**

4 **Q.** Dr. Tierney, could you please give us an overview of the
5 methods you used to arrive at the conclusions you told us
6 about earlier?

7 **A.** Yes. Upon being asked by the State of North Carolina to
8 look into the financial and economic challenges that might
9 face the Tennessee Valley Authority if it were to have an
10 order to adopt a pollution control program, I began to review
11 a number of documents in the public domain which contained
12 financial, economic and operational information for the
13 Tennessee Valley Authority.

14 These are things like the annual reports, the annual
15 information statements. When it was available, I looked at
16 the filing of the TVA before the Securities and Exchange
17 Commission. TVA files annually a number of government
18 reports to the Office of Management and Budget and to
19 Congress. I looked at those. I looked at a number of
20 reports by other public organizations, such as the general
21 accounting office and congressional offices with regard to
22 the Tennessee Valley Authority.

23 I reviewed those to understand the context for TVA's
24 conditions, and, by that, I mean their financial conditions.
25 Additionally, I reviewed the -- I read the Tennessee Valley

1 Authority Act and the bond resolutions under which TVA issues
2 debt instruments that are backed by the rate-making
3 capabilities and authorities of the Tennessee Valley
4 Authority.

5 I reviewed a number of other documents in the public
6 domain, again, to try to get an understanding of the
7 constraints under which the board of directors and management
8 of the organization carry out their obligations to serve
9 customers under the TVA Act, they're responsibilities to
10 repay bondholders for debt that has been issued; to
11 understand what the rates look like for customers of the TVA;
12 to understand what TVA was identifying as its strategic
13 challenges.

14 So I was reviewing those things in order to provide
15 context for understanding essentially how I would put myself
16 in the shoes of a senior member of TVA management or board
17 having a responsibility to undertake a large new capital
18 program such as proposed by North Carolina.

19 Additionally, I received information from another of
20 North Carolina's witnesses, Dr. James Staudt, with regard to
21 certain assumptions to use for the cost of the program for
22 pollution control. Dr. Staudt gave me -- I relied on a
23 number of inputs from Dr. Staudt about the size of the total
24 investment that would be involved.

25 Dr. Staudt initially indicated a \$3 billion program, and

1 he indicated what assumptions I should use about how TVA
2 would undertake that program over a five-year period from
3 2008 to 2013 -- up to 2013, and using a standard method used
4 in the utility world to analyze how a new expenditure or a
5 new investment would be undertaken, both from a financial
6 investment point of view and then from the point of view of
7 how it would recover the cost of that investment from
8 consumers over time.

9 I developed a point of view about how the dollars would
10 be spread over time associated with a \$3 billion initial
11 capital program. Using a methodology that is very standard
12 in the utility business that is called a "cost-of-service
13 analysis," I determined what it would cost over the years in
14 which this program would be in effect and I analyzed what it
15 would mean for electric consumers in the service area of the
16 Tennessee Valley Authority, and I used very standard methods
17 to go about that, which essentially spread the cost of
18 investment across the consumers. And I assumed some kind of
19 average approach to doing that. There are different ways to
20 do that. But I assumed that every person would pay his or
21 her pro rata share of that investment over time.

22 And with that, I tried to analyze this, again, against
23 the constraints, to understand whether or not I thought that
24 TVA would have the ability to finance in the debt markets
25 \$3 billion, given certain constraints under which it

1 operates, which principally includes a \$30 billion debt
2 ceiling in law.

3 Additionally, I analyzed that challenge of a \$3 billion
4 investment, given TVA's authority and responsibility to set
5 rates, to collect all costs associated with providing for
6 power service in the service area, and I concluded that TVA,
7 indeed, would be able to finance in debt markets the
8 investment in question and then proceed to be able to recover
9 that in rates.

10 I concluded that it would be feasible, therefore,
11 financially for TVA to proceed and undertake with this
12 program, and the rate impacts associated with this
13 investment, I concluded, were also reasonable, and on the
14 order of magnitude that TVA itself has undertaken from year
15 to year, and certainly on the order of magnitude of other
16 utility rate increases that have been managed in the electric
17 industry.

18 **Q.** Dr. Tierney, did you also look at TVA's capital cost
19 estimate of \$5 billion?

20 **A.** Yes, I did, using the same methodology that I just
21 described.

22 **Q.** So let's talk now about some of the specific aspects of
23 TVA's organizational and financial structure that you found
24 particularly important for your analysis.

25 Again, I'll refer you to Plaintiff's Exhibit 410 for

1 identification. It should be the next one after your CV in
2 your binder. And can you identify this document for us?

3 **A.** Yes. This is the so-called Form 10-K, annual report of
4 TVA. This particular version was the most recent 10-K filing
5 of TVA that's submitted to the Securities and Exchange
6 Commission. This is filed at the end of 2007 for the period
7 ending at the end of September, 2007.

8 **Q.** Can you tell us, Dr. Tierney, what structure -- what
9 factors in the organizational financial structure at TVA you
10 found particularly significant in your analysis?

11 **A.** Yes. I'm going to ask you to turn to -- I'm going to
12 just describe TVA, if that's all right, in responding to that
13 question and ask you to turn to page -- I don't see a page.
14 It's a map of TVA service territory.

15 **Q.** So it should be the fourth page of this document.

16 **A.** That's right.

17 **Q.** Okay. We can blow that up on the screen so you can see
18 it a little better.

19 **A.** Perfect. So what you see before you in this document is
20 a depiction of the TVA service territory. This is a
21 footprint often understood as a franchise area of a utility.
22 This is the territory in which TVA is authorized to provide
23 service under the TVA Act, and there are certain aspects of
24 the service territory that are similar and different to other
25 utilities.

1 Let me talk about some of the things that are similar.
2 TVA is a very large, multistate utility, providing generation
3 and transmission service. There are many other large,
4 multistate, investor-owned utility companies in the
5 neighborhood also operating in the franchise area.

6 This one, as you can see, shows that TVA serves most of
7 Tennessee and a little bit of six other states. So,
8 predominantly, TVA serves in Tennessee, but it certainly does
9 provide distribution companies in a number of other states as
10 well.

11 When I refer to distribution companies, here is what I
12 have in mind. TVA provides the production of power and TVA
13 transmits that power and then resells it under contract to
14 distribution entities. Those are typically publicly-owned
15 utility companies which are local in size. There are
16 approximately 160, maybe 158 local distribution utilities to
17 which TVA provides electric service at wholesale; and then
18 those distribution utilities provide to what I call the
19 end-use customers, the stores, the hospitals, the homes,
20 et cetera, of the customers in the Tennessee Valley Authority
21 franchise area.

22 TVA operates a mix of power plants that you've heard a
23 lot about, I'm sure. That it includes coal plants, nuclear
24 plants, hydroelectric facilities, and that makes it very
25 similar to many of the other utilities which are also very

1 large. TVA is one of the largest owners of power generation
2 capacity anywhere in the United States and it operates its
3 system in inter-connection to utilities across the border.

4 In other words, the power lines run across the border of TVA
5 and connect to the systems of neighboring utility companies.

6 TVA operates under standards that are consistent in the
7 electric industry and overseen by what is now an independent
8 reliability organization.

9 Additionally, TVA, like many of these utility companies,
10 is an organization whose rates reflect the cost to provide
11 utility service. That means the cost associated with
12 building power plants, operating power plants, buying fuel,
13 hiring people to run the transmission lines and to operate
14 trucks, et cetera, those are all the costs to provide utility
15 service in the service territory.

16 TVA has a board of directors that is appointed by the
17 president, and TVA's board of directors is responsible for
18 assuring that its rates cover its costs. TVA's bond
19 resolution assures debt holders that -- or debt issuers that
20 TVA will repay the bonds by raising the rates, if necessary,
21 to cover the cost of providing service.

22 TVA sets rates to cover not only investment -- and
23 investment, as I said, includes the hardware at power plants,
24 the turbines that run the generating facilities, but also the
25 pollution control equipment, as well as the fuel to operate

1 the power plants. And recently TVA adopted a change in its
2 rate-making policy because fuel prices are so expensive
3 lately that TVA was finding that they were running behind in
4 keeping up with fuel cost changes. So they adopted a special
5 provision which is very common in the electric industry in
6 this part of the country. It's called a fuel adjustment
7 clause. And it allows TVA's board of directors to change its
8 rates on a quarterly basis, if necessary, to track and absorb
9 the cost of fuel and pass the cost along to consumers.

10 TVA is a very large, sophisticated organization; has a
11 planning staff, a financial staff, a management which is as
12 sophisticated as many, if not all, of the large utility
13 companies in the United States. TVA is a little bit
14 different from some of its other large, multistate companies
15 owning, generating and transmission. TVA does not have
16 shareholders. It's owned by the U.S. government, as you
17 know, and TVA, therefore, can only raise money by going to
18 the debt markets. There are no shareholders or private
19 investors, so TVA issues bonds and other things that are
20 called instruments of indebtedness. That's the nomenclature
21 in the Tennessee Valley Authority Act for issuances of
22 instruments of debt.

23 TVA must operate such that its statutory debt, things
24 that count under the \$30 billion cap, never goes above
25 \$30 billion at any one time. And the TVA Act is precise with

1 regard to the types of debt instruments that are and are not
2 covered under that cap.

3 TVA is, like many utilities, subject to a number of
4 state and federal laws, such as pollution control laws; but
5 TVA is not rate-regulated by a state government or by the
6 federal government. That makes it very different from any of
7 the other investor-owned utility companies in neighboring
8 areas where the rates that are charged are subject to
9 approval by the state regulators or by the federal
10 government.

11 So that's the beginning of some of the features of TVA
12 that describe it as an institution, kind of, in the financial
13 and organizational world.

14 Q. And this Plaintiff's Exhibit 410 for identification,
15 this 12-12-07 Form 10-K, does this also summarize TVA's
16 revenues?

17 A. Yes, it does.

18 Q. And is that shown on the same page as the map of the
19 service area?

20 A. Yes.

21 MR. GOODSTEIN: Maybe we can enlarge that on the
22 screen, please?

23 BY MR. GOODSTEIN:

24 Q. And can you summarize the revenues that are shown in the
25 TVA's form 10-K, Dr. Tierney, please?

1 **A.** Yes. This shows revenues for three 12-month periods.
2 The last one on the left most column is for 2007 for the
3 period ending September 30th, 2007. This shows that TVA has
4 operating revenues of approximately \$9.2 billion in 2007.
5 That's up from 9.17 billion in 2006, and up from 7.78 billion
6 the previous year, in 2005.

7 This chart also shows the sources of sales and the
8 sources of revenue broken down by types of customers. These
9 are TVA's customers.

10 TVA sells most of its electricity product, if you will,
11 to municipalities and cooperatives. Those are the
12 distribution utilities I was referring to a minute ago. This
13 shows that 7.77 billion of the 9.2 billion in 2007 came from
14 sales to customers of the municipalities and cooperatives.
15 And those are, again, the local electric distribution
16 utilities in the TVA area.

17 TVA also sells electricity to a number of large
18 industrial customers, and those are listed in the second row
19 where it says, Industries Directly Served. Those are sales
20 amounting to 1.2 billion in 2007.

21 And then TVA sells a small -- a relatively small amount
22 of electricity products to other federal agencies amounting
23 to approximately just over \$100 million.

24 **Q.** And referring you, Dr. Tierney, to the page before this
25 one in the TVA's 10-K. Does this provide a breakdown of the

1 electricity sales revenues by state?

2 A. Yes, it does.

3 Q. And what does this show?

4 A. So, just to orient you to this, the very bottom row
5 shows operating revenues, and the numbers in this row are
6 identical to the numbers in the bottom row in the previous
7 chart. So these numbers add up. Essentially, 2007 shows
8 9.2 billion in operating revenues. And this shows, if you
9 look under the 2007 column, that TVA sells most of its
10 power -- most of the dollars associated with TVA sales of
11 power come from sales in Tennessee, but it also shows that
12 there are sales of electricity in Alabama, Georgia, Kentucky,
13 Mississippi, North Carolina and Virginia.

14 The sales for reseller are small sales to wholesale
15 entities. But this is essentially indicating that TVA's
16 sales occur in that footprint or the franchise area that I
17 described previously in the map on page 4 of this exhibit.

18 Q. And can you also tell us what market protections that
19 TVA enjoys for its service area?

20 A. Yes. Under the Tennessee Valley Authority Act, there is
21 a provision which has come to be called the
22 anti-cherrypicking, act or a fence. This is a ring around
23 the service territory. TVA is not permitted to sell outside
24 of that service territory or outside of that fence, and TVA
25 does not have to provide transmission service to some other

1 party who would like to sell electricity inside of the
2 fence -- inside of the TVA fence.

3 So there is one entity that has been exempt that I'm
4 aware of from the anti-cherry-picking provisions, and that's
5 Bristol, Virginia. Otherwise, the users of electricity
6 within the service territory, in theory, have the option to
7 leave Tennessee Valley Authority's service, but, to do so,
8 they would have to either build their own power plants or
9 they would have to figure out how to get power transmitted
10 over new lines or build their own power lines because TVA is
11 not required to move power within its fence from somebody
12 outside of the fence.

13 So this provides some protections for TVA. TVA
14 describes these protections in numerous documents when it's
15 describing the strength of the organization, the strength of
16 its ability to sell electricity in the region, its strength
17 of being able to retain customers because of that fence and
18 anti-cherry-picking provision.

19 **Q.** All right. I'd like to refer your attention, Dr.
20 Tierney, now to Plaintiff's Exhibit 401 for identification.
21 And can you give us an overview -- well, first, can you
22 identify this as a figure that came out of your report?

23 **A.** Yes. It is a figure from my initial report.

24 **Q.** Okay. So in reference to Plaintiff's Exhibit 401 for
25 identification, can you tell us about some of the

1 similarities of TVA to these other utilities that operate in
2 the region and what some of the major differences are between
3 TVA and these neighboring electric utility systems?

4 A. Yes. Exhibit 401 shows TVA in blue dark color, and it
5 indicates a number of circles and words that represent
6 different utility companies in neighboring areas.

7 To the south is the Southern Company. Southern Company
8 has a number of affiliated subsidiary companies that serve in
9 Georgia, Alabama, Mississippi, to the best of my
10 recollection. And the Southern Company is, like TVA, a very
11 large, multistate utility company owning nuclear plants,
12 owning coal plants, and serving in a franchise area to the
13 south of the TVA.

14 To the east of the Tennessee Valley Authority is
15 Progress Energy and Duke. Duke also owns and merged with
16 Synergy, which you see in the right-hand corner, which serves
17 in Ohio. Those, again, are very large coal-power production
18 utility companies. They own transmission; they own other
19 power plants; they serve customers in their own franchise
20 areas. To the north of TVA are the utility companies that
21 are commonly known as Louisville Gas and Electric -- it's
22 shown as LG&E -- and Kentucky Utility. That's KU. Those are
23 held by a holding company called E.ON. E.On is a German
24 utility company and owns the Kentucky Utility.

25 To the west and north of TVA is Amren service territory.

1 Amren is the holding company, holding a number of other
2 subsidiary companies called Amren and various other utility
3 names for those, serving in Missouri and Illinois largely.

4 To the west of TVA and to the southwest are the Entergy
5 System Company. Entergy Arkansas and Entergy Mississippi
6 are shown on this particular map, which is Exhibit 401. The
7 circles represent the approximate stylized service
8 territories. They're actually much larger than those
9 circles. The power plants are located around the area of
10 transmission.

11 Each of these companies connects to the TVA. TVA
12 actually serves, if I recall correctly, as the grid operator,
13 the independent grid operator, for some of the Kentucky
14 utilities.

15 So these are a number of companies. All of these are
16 investor-owned utility companies. Their rates charged to
17 retail consumers in the state are subject to rates that are
18 set by the states of North Carolina, South Carolina, Georgia,
19 Alabama, Mississippi, Arkansas. And so when I named a state,
20 they set the rates for the sales of electricity in those
21 states.

22 So there are circumstances where the utility may
23 actually make an investment, and if the state public utility
24 commission decides that the expenditure was not prudent, the
25 utility may not be able to recover those dollars from

1 consumers. That is unlike TVA. TVA, its board sets its own
2 rates and it is mandated to set rates to cover its costs.

3 Q. And how do TVA's rates compare to that of neighboring
4 other utility systems shown on 401 for identification?

5 A. Quite favorably. TVA's rates are relatively low. They
6 are not the lowest of the companies shown on this list.
7 Kentucky, typically, over the years, has lower rates than
8 TVA, but the rates of the customers in the other states are
9 typically higher. Generally higher.

10 And I actually have a -- I've prepared a document
11 showing that in my report.

12 Q. Okay. So why don't we then look at Plaintiff's Exhibit
13 394 for identification.

14 A. Perfect.

15 Q. And that's a summary you prepared, Dr. Tierney?

16 A. Yes, it is.

17 Q. And can you explain to us what it shows, please.

18 A. Yes. I'll tell you what the bottom line is and then how
19 I created this.

20 Using information that was available in the public
21 domain at the time I prepared my report, I looked at the
22 average electricity rates in each of the states. I pulled
23 out TVA. TVA's service territory covers seven states, or
24 portions of seven states, so each of the remaining portion of
25 the other states do not include TVA's sales in those states.

1 So TVA, in 2005, had among the lowest rates of the states in
2 the area surrounding TVA.

3 Now, within Kentucky, the actual rates will vary from
4 one of those electric utility company service territories to
5 another. Similarly, that would be the case in Mississippi,
6 et cetera. So these are the averages across the states. And
7 it shows that, as of 2005, TVA had the second lowest rates.

8 From year to year, the rates may vary slightly with the
9 position shifting one or another, but TVA has consistently
10 had amongst the lowest rates of the states in the vicinity.

11 Q. And you also looked at how TVA's rates compared to the
12 national average?

13 A. Yes.

14 Q. And I'll show you Plaintiff's Exhibit 403 for
15 identification. Is that your summary of the comparison of
16 TVA and some other state rates to the U.S. average?

17 A. Yes. This shows the same set of states that was
18 included on the prior exhibit, and it just shows the actual
19 numbers. And it also shows that, on average, the United
20 States electricity consumer paid 8.14 cents per kilowatt
21 hour. TVA, in 2005, had retail sales in its service
22 territory of 6.04 cents.

23 Just as a benchmark, there are portions of the country
24 that have rates as high as, I think in this time period, it
25 was probably around 12 or 13 cents per kilowatt hour, and

1 today those are as high as about 18 cents per kilowatt hour.

2 Q. Have you looked at rates in the region since 2005?

3 A. Yes.

4 Q. And what is the picture? How does TVA compare to the
5 other utilities in the region?

6 A. TVA remains on the relatively low side. Again, there is
7 year-to-year slight variation. In terms of the actual
8 average rates, TVA consistently remains low and well below
9 the national average.

10 Q. So, in looking at some of TVA's unique features, did you
11 look at any statements made by financial officers at TVA?

12 A. Yes, I did.

13 Q. I want to show you Plaintiff's Exhibit 393 for
14 identification. And can you identify this and explain what
15 it shows?

16 A. Yes. This is a page from a presentation that was made
17 by TVA's financial executive, Mr. Hoskins, to the LaSalle
18 Fixed Income Symposium in January, 2006. This was a
19 multipage power point presentation that Mr. Hoskins gave to
20 the investment community about TVA and the solidness of its
21 financial situation.

22 And as part of that, TVA's -- Mr. Hoskins described some
23 of the features of TVA by describing that it is advantaged by
24 having one owner, as indicated here; that it is
25 self-financed; and that its rates are set by the board and

1 that, on a statutory basis, TVA is required to cover its
2 costs through the rates charged to consumers, and that those
3 costs include paying back interest and principal on debt
4 borrowed from debt issuers.

5 Additionally, just one other thing to note on this, and
6 that is that TVA's debt instruments are tax exempt for a
7 number of types of things, such as, I think, if I recall
8 correctly, gift tax, inheritance tax, and state and local
9 tax.

10 Q. Did that same presentation by Mr. Hoskins also summarize
11 the investor advantages that TVA offers?

12 A. Yes.

13 Q. And I'll show you Plaintiff's Exhibit 391 for
14 identification. And can you identify that and explain what
15 it shows, please.

16 A. Yes. This is from the same presentation made by
17 Mr. Hoskins to the investment community, and, as you can see,
18 he's describing what TVA views as its own advantages as a
19 place where investors should put their dollars.

20 Mr. Hoskins identifies that TVA's power bonds are rated
21 triple A. Actually, he does not say -- I apologize -- he
22 doesn't say that they're rated triple A. He said that they
23 received the highest credit rating, and, in fact, that is
24 triple A from Standard & Poors. So he identifies their very
25 high quality-credit, credit quality debt instruments. He

1 identifies the fact that TVA, under its authorities and bond
2 resolutions, must repay the bondholders first with dollars
3 that it receives from the power sales from TVA. TVA's bonds
4 that are issued are issued for all things related to the
5 power program. This is the purpose of the issuance, the
6 third bullet on this page. That means all of the dollars
7 that are raised in debt markets are essentially fungible.
8 They go to support the power program in its many dimensions
9 that include power line investments, power plant investments,
10 including the equipment associated with pollution control.
11 And as I mentioned, he identifies that there are certain tax
12 exemptions associated with the bonds that TVA issues. And he
13 identifies, and I agree, that these are investor advantages.

14 **Q.** I'll show you Plaintiff's Exhibit 392 for identification
15 next. And is this another slide from Mr. Hoskins'
16 presentation?

17 **A.** Yes, it is.

18 **Q.** And what does this show?

19 **A.** What this shows is the array of possible credit ratings
20 that Standard and Poors, the rating agency, might give to a
21 utility company.

22 So this was 2005, December, 2005. It showed that there
23 are certain investment-grade credit ratings. Those are shown
24 on the left-hand side of the chart. These are things that
25 are appropriate for pension funds and other organizations

1 seeking to have high quality investments. And on the
2 right-hand side of this chart there are speculative credit
3 ratings.

4 This shows that there are a large number of utility
5 companies that, as of December, 2005, had investment-grade
6 ratings. Only one of them had the highest rating, a triple A
7 rating. That is TVA. And to best of my understanding today,
8 TVA remains the only triple A rated electric utility. This
9 is ratings not only of TVA, which, as I've mentioned, is a
10 public-owned utility, but this chart also shows the ratings
11 for investor-owned utility companies. There has been a
12 recent trend in the industry to move utilities downward in
13 their credit ratings. Mr. Hoskins identifies here that TVA
14 was the highest-rated utility company, and, as I say, that
15 remains the case today in terms of its high quality credit.

16 Let me just mention that one of the implications of a
17 high credit rating is that investors can be assured that they
18 will be repaid. This shows -- a credit rating depicts the
19 analyst's view about how risky it is that there will be
20 repayment of the debt. This shows that there is a very sound
21 expectation that the debt issuer will be repaid both
22 principal and interest. What that means is that it's lower
23 risk. TVA then can get its money at a lower interest rate
24 than utilities who are on the other side, to the right, in
25 terms of lower credit ratings. Anyone to the right of TVA on

1 this chart with a lower credit rating will have to borrow
2 money at a higher rate than TVA, all else equal. All else
3 equal.

4 Q. And you had a figure in your report which showed TVA's
5 comparison of capital cost as compared to other utilities.

6 A. Yes.

7 Q. I'll show you Plaintiff's Exhibit 404 for
8 identification. And is that your figure?

9 A. Yes.

10 Q. Can you explain to us what it shows?

11 A. Yes. This chart has a bar representing the cost of
12 capital, or what it takes to pay investors to borrow money,
13 either as debt or as equity. And each of the companies that
14 are listed on here is one of the companies that was shown on
15 a previous map, the map of the service territories that was
16 on Exhibit 401: Southern Company, Amren Energy, Progress,
17 Duke, E.ON. I've also added American Electric Power.
18 American Electric Power serves in a number of the midwest and
19 surrounding states in this area.

20 And what I'm showing on here is, as of the time I did my
21 analysis, which was, if I recall, the fall of 2006, I
22 analyzed the then current cost of capital on a weighted
23 average base for each of these utility companies.

24 Let me just explain what that meant. For TVA, this is
25 the average interest rate of the debt instruments or the

1 bonds that TVA has issued. So TVA has issued over
2 \$20 billion in bonds; this represents the average cost of
3 capital associated with those bonds as of this period of
4 time.

5 Additionally, for each of the other companies, this
6 represents their weighted cost of capital. It's their
7 average charge that they have to pay in order to use somebody
8 else's money for investment. And this reflects two different
9 types of ways in which they get money from investors. Part
10 of this weighted average cost of capital is from debt, and so
11 it's their actual historical debt and the cost of actually
12 borrowing that money from a variety of parties, including
13 bondholders. Additionally, it's the average shareholder
14 return that those companies are allowed to charge in their
15 rates under the rates that are set by the utility regulators
16 in their states. Utility regulators actually set the profit
17 rate that's allowed to be set -- to be included in its rate.
18 So in each of these companies, the average weighted cost of
19 capital represents their access to money for investment
20 purposes and how costly it is.

21 TVA shows here that as of this period of time it was
22 less than 6 cents -- excuse me -- 6 percent interest rate.
23 The weighted average cost of capital of every one of these
24 other utility companies is higher than that. In fact, it's
25 gone higher than that in recent years for these companies.

1 TVA remains cheap in terms of its -- I said that wrong. Let
2 me start that sentence over, please.

3 TVA can borrow money more cheaply than other utilities,
4 partly because it doesn't have any equity shareholders, and
5 equity shareholders are riskier because they get repaid after
6 shareholders. So that's a riskier form of investment. It
7 costs more to get money from equity shareholders. Every one
8 of the other companies that are listed on this exhibit has
9 equity in its cost of capital. But also, because TVA's debt
10 is so highly rated by Standard and Poors and Moody's, it can
11 borrow more cheaply than any of these other companies can, so
12 the combined effect of low cost debt and equity capital means
13 that TVA's cost to borrow money is lower.

14 All else equal, that means TVA could operate and make
15 investments more cheaply than any of these other companies.

16 **MR. GOODSTEIN:** Your Honor, we'd like to offer
17 Exhibits 435, which is Dr. Tierney's CV; 401, the map of
18 TVA's neighbors; 394, 403, 393, 391, 392 and 404 into
19 evidence at this time.

20 **THE COURT:** Let those be admitted.

21 **(Plaintiff's Exhibits 391, 392, 393, 394, 401,**
22 **403, 404 and 435 received.)**

23 **BY MR. GOODSTEIN:**

24 **Q.** Dr. Tierney, are you aware of actions that TVA has taken
25 to reduce its debt, its capital debt?

1 A. Yes.

2 Q. I want to refer your attention to Plaintiff's Exhibit
3 415 for identification. And is this a presentation to
4 investors that was done by Tom Kilgore, the president and CEO
5 of Tennessee Valley Authority?

6 A. Yes, it is.

7 Q. And referring your attention to page 21 of that
8 document, can you explain to us what this slide shows.

9 A. Yes. This slide shows that in a period from 1997
10 through 2006, TVA lowered its debt and other financing
11 obligations per unit of capacity of power plants owned by
12 TVA.

13 So TVA took all of the megawatts of power plant capacity
14 of all of its power plants and it compared those megawatts to
15 how much debt and other financing instruments were
16 outstanding in each of those years, and it shows that, over
17 time, the ratio of debt in other financing obligations
18 dropped year to year, as you can see here on the chart, or
19 almost year to year. There was certainly a downward trend.
20 Then that came as a result of a number of things, but
21 probably most importantly, TVA's initiative to attempt to
22 reduce its debt.

23 TVA, in the early 1990s, had begun to approach its debt
24 ceiling of \$30 billion, and TVA was encouraged by a number of
25 parties, including, if I recall correctly, the office of

1 management and budget, as well as potentially, again, as I
2 recall, the general accounting office, to begin to provide
3 more flexibility and security for TVA's management of its
4 finances by reducing its debt below the \$30 billion.

5 So TVA has had a strategic objective for a number of
6 years to reduce its overall debt profile, and this shows that
7 TVA has had some substantial progress in accomplishing that
8 result.

9 **Q.** Now, referring your attention to the next slide in that
10 exhibit, page 22. Can you explain to us what that one shows?

11 **A.** Yes. This is a conceptual schemata, if you will, that
12 identifies a profile of management of debt and other
13 financial obligations from the current time, as of the
14 current time of this presentation by Mr. Kilgore, which was
15 2006-2007, up through approximately a 30-year period. It
16 indicates that TVA's existing debt is -- shown in that light
17 orange or tan color -- it shows that existing debt was,
18 according to this, above or near \$25 billion. And TVA
19 includes in that number other financing obligations. Those
20 are things that are above and beyond what the TVA mandate for
21 what debt falls below the \$30 billion cap. TVA includes not
22 only debt, but these other financing obligations as
23 instruments that TVA is attempting to manage and balance
24 against a debt ceiling. These other financial obligations
25 are things where TVA has a lease-back agreement with a third

1 party. They sell somebody a power plant, the power plant
2 owner leases it back to TVA, and this serves as a way in
3 which TVA can provide financing for its activities, and,
4 technically, those other financing obligations don't count
5 under the \$30 billion ceiling. This shows that when you add
6 those to the existing debt, there is a profile that shows TVA
7 will expect to keep its total of those manageable over time
8 at approximately some number -- this is, as I say, kind of a
9 schematic. This appears, by eyeball shot, to be around
10 \$27 billion a year. The existing debt represents debt that
11 is actually outstanding as of the time of the presentation,
12 and the maturities of those borrowings, they taper down over
13 time.

14 So you can see, you know, there was a debt for a 30-year
15 bond. That 30-year bond would be paid off -- if it was
16 issued in the year 2000, that would be paid off in the year
17 2030. There are a variety of maturities, and, therefore, at
18 any snapshot point in time, those existing debt instruments
19 taper off.

20 But TVA has indicated in this picture that they will
21 manage and most likely issue new debt, and that's shown in
22 the brighter yellow color. So as they're tapering down some
23 older debt, they'll refinance and/or take out new debt. So
24 they'll manage their financial portfolio within this target
25 range that they've identified.

1 **MR. GOODSTEIN:** And, Your Honor, I see that this
2 copy is not very good. It didn't get the color of the areas.
3 So you can see it on the monitor, and we'll get a better copy
4 of this and replace it in the record. Sorry about that, Your
5 Honor.

6 **THE COURT:** All right.

7 **BY MR. GOODSTEIN:**

8 **Q.** Dr. Tierney, did you see some information that updates
9 the data that we're looking at here to show that TVA is
10 continuing to service debt at very low costs?

11 **A.** Yes.

12 **Q.** Okay. I'll refer your attention to Plaintiff's Exhibits
13 420, 421, 422 and 423, which is a series of information that
14 you reference in your report. And maybe we can go through
15 these quickly and you can just explain to us the
16 significance -- first of all, what they are, and the
17 significance of these announcements by TVA for your analysis.

18 **A.** Sure. These four exhibits are four press releases
19 issued by TVA at four different periods of time in the last
20 three years, and they represent announcements by TVA of
21 successful bond issuances. They represent a large dollar
22 quantity and low interest rates.

23 So let me just start with the first one quickly. On
24 June 15th, 2005, TVA issued 1 billion dollar debt, now, in
25 other words, bonds, that would be for 10 billion -- for

1 1 billion, and these would be repaid in ten years. And TVA
2 announces here, you might see in the first paragraph, a
3 couponed rate of 4.375 percent. That represents the interest
4 rate in effect for this bond.

5 Additionally, what TVA did in this was refinance some
6 other debt that it had borrowed at a much higher rate. So
7 this is like refinancing your house with a cheaper mortgage
8 rate, when that's possible to do. TVA was able to do that
9 here and replace some of its more expensive debt with cheaper
10 debt.

11 TVA indicates here that -- in a second paragraph,
12 Michael Rescoe, the chief financial officer, says that the
13 success of the transaction is indicative of TVA's ability to
14 match its own financial needs with those investors around the
15 world and to keep on track with its current interest rate
16 forecast.

17 Let me turn your attention to the next one, which is
18 421. This is was an announcement in March of 2006. TVA
19 issued another \$1 billion for a 50-year bond, and in this TVA
20 announces that it borrowed -- I think this was a record.

21 Yes. In the first paragraph, this is the largest
22 50-year transaction ever for a U.S. agency or corporate
23 issuer with a lowest coupon rate ever for a 50-year bond.

24 This issuance was -- if you scroll down a minute to the
25 fifth paragraph. This indicates that TVA's -- that interest

1 in TVA's debt was twice as large as the bond issuance
2 occurred.

3 So there is a paragraph that says "Demand for the bond
4 produced an order book that was more than twice the amount
5 billion-dollar size." Meaning this was a very attractive
6 bond issuance in the investment community at that time.

7 Please turn your attention to the next exhibit, 422.
8 This was at the first of this year, January 17th, 2008. TVA
9 issued half a billion dollars in a 40-year power bond. This
10 had a coupon rate or an interest rate of 4.875 percent
11 interest.

12 The fourth and fifth paragraphs of this announcement
13 indicate that this was the lowest ever coupon rate, or the
14 lowest ever interest rate, for a bond with a 40-year
15 maturity. The ultra long-term combined with the low coupon
16 rate will allow TVA to extend the average life of its
17 financing portfolio while reducing its overall cost of
18 borrowing. TVA identifies, once again, that it has the
19 highest bond rating of utilities, showing a triple A rating
20 by Fitch and Standard and Poors.

21 Finally, in Exhibit 423, more recently, in what we
22 already know is a pretty troubled investment climate at the
23 moment, TVA announced on March 6th, 2008, that it had issued
24 another billion dollars in power bond at a coupon rate of 4
25 and a half percent. TVA said it was able to take advantage

1 of its strong credit rating and move out quickly for
2 favorable market conditions and financed this at very low
3 cost.

4 Together, we've just gone through three and a half
5 billion dollars of bond issuances. TVA has actually issued
6 more bonds than I've illustrated with these four press
7 releases, and those bonds continue to show that TVA's
8 financial strength and its advantages to investors remain
9 very strong and very attractive, especially compared to many
10 other targets of investment in the utility community today.

11 **MR. GOODSTEIN:** Your Honor, at this time we offer
12 Plaintiff's Exhibit 415, 420, 421, 422 and 423 into evidence.

13 **THE COURT:** Let those be admitted.

14 **(Plaintiff's Exhibit 415, 420, 421, 422 and 423**
15 **received.)**

16 **BY MR. GOODSTEIN:**

17 **Q.** Dr. Tierney, can you summarize for us the impacts of
18 TVA's low rates and their low cost of capital that you've
19 described on TVA's power system? What's the effect of those
20 things?

21 **A.** In simplest terms TVA stands head and shoulders among
22 its colleagues in the electric utility industry as being a
23 very strong, creditworthy entity. It can attract investments
24 through very low cost debt. It can undertake its power
25 program at interest rates that are lower than other utility

1 companies in the United States. It is viewed attractively by
2 investors, and it has the advantages associated with assuring
3 that its rates cover its costs, that bondholders are repaid,
4 that it has a sophisticated financial management. All of
5 those mean that TVA has the means to carry out a large
6 investment program going forward with confidence.

7 **Q.** And what's the significance of TVA's rate-making
8 authority to your analysis?

9 **A.** It's very significant to my bottom line, and that is
10 that TVA's ability and responsibility to set its own rates,
11 to cover its costs and to keep costs as low as feasible and
12 to provide reliable electricity service to its consumers
13 means that TVA has the authority, basically, to get the job
14 done.

15 If it is approaching its debt ceiling and it must
16 undertake an investment to keep the lights on, to keep
17 pollution at acceptable levels, for whatever reason that the
18 board determines is appropriate to responsible service, TVA's
19 board has the ability to actually raise rates to make sure
20 that the investment requirements can be undertaken.

21 **Q.** All right. So with that background, Dr. Tierney, that
22 background on your analysis, let's look at your evaluation of
23 the feasibility and reasonableness of TVA financing of the
24 emissions reductions in air emissions from its coal-fired
25 power plants sought by North Carolina in this case.

1 How did you go about looking specifically at the cost of
2 this additional control program and how feasible and
3 reasonable that was financially for TVA?

4 **A.** I started by thinking about this investment the way that
5 a utility typically would think about it, which is I've got
6 to undertake infrastructure investment; I will borrow either
7 from my cash reserves, from my shareholders -- there are none
8 for TVA -- or my debt holders, to borrow money to fund an
9 investment program.

10 I relied upon Dr. Staudt to tell me how large an
11 investment. In this case it was \$3 billion. And I
12 eventually looked at a \$5 billion estimate by TVA.

13 I thought about how the utility would undertake that.
14 And Dr. Staudt asked me to assume that TVA would spend
15 one-fifth of the investment cost in each of five years. So
16 from 2008 through 2012, I assumed that one-fifth of
17 \$3 billion or one-fifth of \$5 billion would be spent, and for
18 the purpose of analyzing the incremental impact of that
19 investment, I assumed that TVA would actually be borrowing
20 money to do that in each of those five years.

21 So for the \$3 billion estimate, I assumed TVA would
22 borrow 600 million in each year for five years, as it was
23 planning for, constructing, and installing the pollution
24 control program.

25 At the end of five years TVA, would have borrowed

1 \$3 billion. I assumed that TVA paid off the interest rate on
2 that debt each year, so that at the end of that period of
3 time TVA had a \$3 billion, or in the case of the \$5 billion
4 investment, a \$5 billion investment, and it had a system with
5 the pollution control equipment in place and ready to go into
6 service.

7 In typical utility rate-making, a cost of an investment
8 for a long-lived capital investment program is spread across
9 the life of the investment. I assumed in this case the life
10 of this investment as given to me by Dr. Staudt. He gave me
11 a 30-year investment -- excuse me -- an investment life, a
12 capital life for the pollution control equipment, and,
13 therefore, I spread the cost of recovering the cost of this
14 three to five billion dollars across that 30-year period.

15 So what that meant was I was -- I had 3 billion or
16 5 billion that TVA had borrowed, and I had to pay back
17 principal each year and I had to pay interest down each year
18 for the amount that I had borrowed until the full amount of
19 exhausted at the end of 30 years.

20 Finally, I analyzed what it would cost to operate that
21 system, and the cost to operate the system was given to me by
22 Dr. Staudt. It was a \$220 million amount to operate and
23 maintain the system. And using very standard utility
24 cost-of-service methodology, in essence, I designed a cost
25 recovery profile for paying back the interest and principal

1 on debt over 30 years, as well as paying the operations and
2 maintenance costs over that entire 30-year period as well.

3 **Q.** So let's look at what your analysis showed, Dr. Tierney.
4 And I'll refer you to Plaintiff's Exhibit 405 for
5 identification. And can you identify that and explain what
6 it shows, please.

7 **A.** Yes. This shows in graphic form what I described in
8 words. And let me just orient you to what's shown on the
9 chart. It shows some orange bars on the left-hand side of
10 the chart from 2008 until 2013, and those represent the
11 borrowing costs associated with an annual \$600 million of
12 bonding. In each of those years, those are the interest
13 costs of having borrowed money in each of those years for the
14 construction program.

15 So you'll see the first bar is after the first year. I
16 borrowed for TVA in my analysis, 600 million, and the
17 interest on that shows that that small little orange bar over
18 on the left-hand side. In 2009, I've got to pay back one
19 year of interest on 600 million.

20 The second year, 2009, and I apologize, these appear to
21 be slightly off in terms of visually, but by the second year,
22 I would have borrowed 1.2 billion. That's two years, at 600
23 a year. And I've got interest to repay. TVA's interest for
24 repayment of that would show up then in that second bar. And
25 then, on -- the first five bars shows just repaying interest

1 such that I have been, at the end of that period, once the
2 pollution control program is going into effect, in 2013, I've
3 got 3 billion that I need to pay back.

4 So what you see then from 2013 to the right on this
5 chart, and in the years through 2042, if I'm recalling
6 correctly, you have three cost elements that show up on this
7 chart. The blue element on the bottom is depreciation cost.
8 Think of that as the cost of wear and tear on the plant, and
9 I'm going to depreciate the plant over 30 years and I'm going
10 to collect an amount in rates associated with recovering
11 investment for 1/30 of the life of the plant. That allows me
12 to repay 1/30 of my bond's principal. Then I'm also going to
13 repay the interest cost of having -- still holding the rest
14 of the bond.

15 So this shows, over time, I'm going to pay each year
16 1/30 of the principal on my bond, which, again, in this
17 particular picture is 30 -- 3 billion -- excuse me, not
18 30 billion -- and my interest goes down as I pay off the
19 principal, so the orange wedge declines as I pay off the
20 principal.

21 The third cost element here in the annual amount that's
22 paid is the \$220 million in operations and maintenance cost.

23 This shows, therefore, that in 2013, which is the
24 highest cost year for recovering the cost of this program,
25 TVA consumers, in effect, would be paying approximately

1 500 million to pay off the investment and maintain and
2 operate this pollution control program, and the cost goes
3 down over time.

4 So, essentially, this would be TVA's cost horizon, its
5 cost profile that it needs to collect from consumers in
6 rates.

7 **Q.** Okay. And so what was your overall conclusion regarding
8 the cost of the additional controls sought by North Carolina
9 and the options available to TVA to finance that cost?

10 **A.** I determined that this would be a feasible and
11 reasonable level of investment for a number of reasons.

12 While \$500 million a year sounds like a lot of money, as
13 it would appear in its highest year just under 500 million in
14 2013 for the \$3 billion program, TVA's revenues, as we
15 indicated, are 9.2 billion in 2006, and TVA is of the size
16 that can handle this amount of incremental addition.

17 I note that TVA's most recent rate increase,
18 essentially, was for an amount larger than this. So TVA
19 raised its rates most recently to recover an incremental
20 amount, unrelated necessarily to what I'm talking about here,
21 for an amount larger than this overall cost impact to TVA.

22 So this was a doable amount for TVA, given its size, its
23 complexity and, most importantly, its ability to raise money
24 in debt markets and its ability to collect that money from
25 consumers through rates.

1 Q. And how do you expect that TVA will absorb the costs of
2 the additional emissions reductions sought by North Carolina?

3 A. Well, if I understand your question right, TVA will
4 manage a portfolio of debt and manage its rate increases to
5 accommodate whatever necessary expenses that it has to run
6 its power program.

7 As I mentioned before, the power program includes
8 whatever it takes to assure reliable service to consumers,
9 keeping the lights on, if you will; it includes investment
10 that TVA has to make in order to add power plants, if demand
11 is growing as TVA expects demand to grow; and that will
12 include, if ordered by this Court, a pollution control
13 remedy. And TVA will manage debt issuances, repayment plans,
14 refinancings and rate increases to live within its
15 \$30 billion cap, retaining sufficient flexibility to keep it
16 financially sound. It will repay bondholders and it will
17 collect from consumers, and be able to do so, an amount to
18 recover the cost of this investment. And in my opinion, this
19 is an amount which is consistent with the type of
20 programmatic responsibilities of the organization, consisting
21 in terms of type, size, quantity, and managability. This is
22 a doable program for an organization the size, complexity and
23 sophistication of TVA.

24 Q. And did you look at the capital costs of the additional
25 controls sought by North Carolina and compare them to TVA's

1 statutory debt ceiling?

2 A. Yes, I did.

3 Q. So let's look at Plaintiff's Exhibit 397 for
4 identification. And is this one of the figures out of your
5 report, Dr. Tierney?

6 A. Yes, it is.

7 Q. And can you explain to us what it shows?

8 A. Yes. If you keep in mind that colored picture you had a
9 minute ago from Mr. Kilgore's presentation.

10 Q. Is that Plaintiff's Exhibit 415?

11 A. Yes. Page 22.

12 Q. Page 22. All right.

13 A. Where existing debt is shown to taper down consistent
14 with maturities of the bonds. What I did was look at the
15 actual maturities of the bonds that were held as of the time
16 I issued my report. And those bonds are shown in the colored
17 bars on this chart.

18 The bottom most colored bar -- a portion of each bar is
19 a dark blue and it represents debt -- long-term debt that are
20 called power bond issuances. Power bonds have the highest
21 quality in terms of repayment by TVA. And as you can see
22 here, as of the time I did my report, the maturities during
23 which TVA would have to pay off those existing commitments to
24 bondholders took this tapering-down effect. That's
25 consistent with what Mr. Kilgore showed on his existing debt

1 in his exhibit. So this is the actual maturities as they
2 existed at the time of my analysis.

3 Additionally, there were non-power bond debt forms that
4 are very light colored blue that in the years from 2008 -- or
5 is it 2006? I can't even read it myself. 2006 through 2018,
6 there are some other non-power bonds that need to be repaid.
7 So those are shown in light blue and they taper off, so that
8 by the early 2020s there are no such prior commitments for
9 those kind of bonds.

10 In yellow are things called discount notes. Those are
11 short-term bonds. These are bonds where -- excuse me. These
12 are debt instruments that TVA issues for a period of less
13 than one year and TVA has to repay them back in a one-year
14 period. In fact, I think it's 270 days. At any one point in
15 time, TVA typically uses those discount notes in a working
16 capital kind of fashion. I assumed in here the amount of
17 discount notes that TVA actually had as of the time I did
18 this analysis, which was the end of 2006, and I think that
19 was \$2.4 billion in discount notes. That amount fluctuates
20 from time to time. It's lower than that right now. And in
21 fact, if this were to be updated, there was a slight
22 reshaping of this overall blue curve, but it has this overall
23 pattern of tapering off.

24 This represents a snapshot in time of commitments
25 already made by TVA. These are commitments that are under

1 the statutory debt ceiling of \$30 billion. I did not include
2 under this debt ceiling things like other financing
3 obligations, lease-back agreements that do not qualify under
4 the \$30 billion cap. And I asked myself, if I put the
5 dollars under here associated with borrowing 3 billion or
6 5 billion, in the case of my \$5 billion analysis, if I added
7 the borrowing associated with that in each year starting in
8 2008 through 2042, what would that do to take TVA up above
9 its existing commitments? And, as you can see, it shows that
10 for the first five years there is an incremental increase of
11 \$600 million a year in bonding, up to the point at which
12 there is principal held that begins -- that principal starts
13 at 3 billion in 2013, and the principal declines over time,
14 because I assumed these would be 30-year bonds that would be
15 repaid at the end of 30 years. So this tells me that this is
16 consistent with the type of profile that TVA is capable of
17 and used to managing.

18 The reason I put existing bonds on this is because any
19 point in the future TVA will have to manage its program of
20 new bonds, assuming its prior commitments and, in my
21 analysis, assuming the \$3 billion program cost and the
22 borrowings associated with that, and TVA would have to manage
23 subsequent refinancings, new bond issuances and other things
24 to live within its cap, and to the extent that it continues
25 to seek to manage a debt-reduction program, TVA will have to

1 balance raising rates with bond issuances in order to have a
2 sound management profile for its finances going forward.

3 Q. And did you do the same analysis, Dr. Tierney, for the
4 capital cost estimate of \$5 billion that was provided by TVA?

5 A. Yes, I did.

6 Q. I'd like to refer you to Plaintiff's Exhibit 398 for
7 identification. And could you explain to us what this figure
8 shows?

9 A. Yes. This figure shows the blue, light blue, and yellow
10 colors are identical from the previous chart that we just
11 discussed, which was Exhibit 397.

12 This shows that same existing commitment profile for
13 debt issuances that TVA has done. It compares it to the
14 \$30 billion cap, and in this case I assumed that the
15 borrowing for the pollution control program would be
16 5 billion, to see whether or not it would be a manageable
17 amount of new debt under the \$30 billion ceiling. It left me
18 with the impression that in the highest year this would leave
19 TVA at an amount at less than 25 billion, and, in fact,
20 closer to \$23 billion relative to its \$30-billion debt
21 ceiling.

22 TVA has indicated through its chief financial officer
23 that it seeks to maintain sufficient room under the cap so
24 that it has flexibility and that they would not go above
25 28 billion. This provides a cushion that will allow TVA to

1 issue bonds for other purposes and manage its financial
2 profile as needed over the years going forward.

3 Q. And do you expect that TVA will need to finance capital
4 expenditures to a level that, when combined with this capital
5 cost estimate and operation and maintenance costs, would
6 approach the debt ceiling?

7 A. No. I would expect TVA to do the job that it's been
8 doing in the past decade, to look at the array of
9 responsibilities that it has for providing reliable power at
10 minimum feasible cost and providing all compliance with
11 health safety and other requirements so that TVA balances
12 issuances below the debt ceiling and rate increases in a way
13 that capably balances, providing all of that electricity
14 service, giving the cost to consumers, the legal requirements
15 that are obligated, including a \$30-billion debt ceiling and
16 repayment of bonds. TVA in my opinion will be able to manage
17 this capably and continue to do its job effectively.

18 Q. Did you look at the impact of this kind of expenditure
19 on additional air pollution emissions reductions and its
20 impact on rates and TVA's customers?

21 A. Yes, I did.

22 Q. And can you explain to us what your conclusions were
23 there?

24 A. Yeah. My conclusion was that the rate increase that
25 would be implied by this investment program that I've just

1 been describing would be of a size that would be absorbable
2 by TVA's consumers, and, therefore, that it would be within
3 the ability of TVA's management to exercise its
4 responsibilities to raise rates to cover these costs and that
5 the rates would have a relatively modest impact on consumer
6 prices.

7 Q. I want to show you Plaintiff's Exhibit 399 for
8 identification and 400 for identification. Look at these one
9 by one. And are these figures that were contained in your
10 reports, Dr. Tierney?

11 A. Yes.

12 Q. And can you explain to us what they show?

13 A. Yes. What I did on this was consistent with how one
14 would look at an incremental impact of a new investment on
15 consumer rates. And in this case, what I did was I took the
16 average consumer rate in TVA's service territory. So this
17 was the average cents per kilowatt hour rate. Previously, we
18 looked at what that rate was in 2005. That was just around 6
19 cents per kilowatt hour. That's the unit of sales and
20 electricity.

21 You see that over on the very left axis. It shows \$0.06
22 per kilowatt hours, 6 cents per kilowatt hour. So that was
23 the historical rates.

24 There is -- then what I did was I tried to analyze how
25 you would spread the cost of the program that we've

1 previously discussed -- and I can't for the life of me find
2 the right chart, which I apologize for. But, in essence, the
3 chart would show -- it was chart 405, actually, Exhibit 405.

4 Q. All right.

5 A. Exhibit 405 showed, again, the need to recover a dollar
6 amount in each year from consumers. So what I did was I took
7 that dollar amount, which in the year 2013, in the \$3 billion
8 case, was below \$500 million, and I spread that across all of
9 the electricity sales expected to occur in TVA's service
10 territory. So I took the dollar amount in 2013, I divided
11 that by total sales, and that produced a cent per kilowatt
12 hour. And that is the bar that you see on the year 2013 in
13 Exhibit 399.

14 The smaller bars from 2009 -- 2008 through 2012 show the
15 increase in rates associated with just interest payments for
16 borrowing the money to build the pollution control program.
17 2013 then, I had the full money of the \$3 billion, plus
18 interest, plus operations and maintenance, and I had to
19 spread that across all the kilowatt hour sales. That came
20 out to approximately a quarter of a penny, 2.5 mills. That's
21 what you see in the bar on 2013. That's the year of the
22 highest rate impact, and as you can see, it declines and
23 tapers off over time.

24 When you compare a quarter of a penny to a 6-cent
25 average, we're talking about a 4 percent rate increase

1 associated with this pollution control program in its highest
2 rate impact year.

3 Now, I just note, I used as my base in that comparison,
4 in that rate impact comparison, the rate that appeared in
5 2005. In fact, in 2013, what consumers will feel will be the
6 rate impact of that quarter of a penny on top of the rates as
7 they're being charged in 2013. All expectations are that
8 that will be higher than 6 cents per kilowatt hour. In fact,
9 the rates have already gone up above that amount already. So
10 the rate increase here is higher than one would expect
11 because I'm using a base of comparison of 2005 year rate
12 increases, and a consumer will actually feel a smaller impact
13 in the year -- in 2013.

14 These are not cumulative rate impacts, by the way.
15 These are the rate impacts relative to 2005. So the rate is
16 going up a tiny bit in 2008, a little bit more in 2009, a
17 little bit more in 2012, such that, by 2013, the total impact
18 is a quarter of a penny.

19 By the way, just one more thing. In this, I grew the
20 amount of electricity TVA is expecting to sell over time, so
21 that I used that to spread the amount of cost among all the
22 sales. And as it turns out, I used an assumed growth rate
23 which is lower than what TVA is using for planning purposes
24 today. I used 1.4 percent increase in sales. TVA is now
25 planning for 1.9 percent electricity sales. That would also

1 lower the rate.

2 Q. And did you do a similar analysis for TVA's \$5 billion
3 capital cost investment?

4 A. I did.

5 Q. I'll show you Plaintiff's Exhibit 400 now for
6 identification, and can you explain to us what that one
7 shows.

8 A. Yes. Using the exact same methodology, I spread the
9 \$5 billion investment cost, the debt repayment, and the
10 operations and maintenance cost across all of the electricity
11 sales TVA would expect in these years, and in this case, the
12 impact on rates in 2013, which is the highest rate year
13 impact, would be 3.5 mills per kilowatt hour, or a third of a
14 penny rate increase associated with the \$5 billion remedy.

15 That works out to be about \$4 a month for an average
16 consumer. Again, that's at the high end range. At the
17 \$3 billion range, it was about \$3 per month per consumer.

18 Q. And did your analysis consider the potential fuel cost
19 savings to TVA from the additional pollution controls sought
20 by North Carolina?

21 A. No, it did not. And I am aware of Dr. Staudt's
22 conclusion or opinion that there will be fuel cost savings
23 associated with running a cheaper fuel, a less expensive coal
24 in the coal plants once the pollution control equipment are
25 in place, and I did not include that benefit, or their

1 countervailing benefit, in my rate analysis.

2 Q. Did you consider how this potential rate increase would
3 affect electricity use by TVA's customers?

4 A. Yes, I did.

5 Electricity use happens to be one of those things that
6 people need a lot, and they tend to use electricity even when
7 there are prices in place -- excuse me -- when there are
8 price increases that occur.

9 Electricity use is relatively insensitive to price
10 increases, and the evidence shows that there are very, very
11 small increases -- excuse me -- decreases in electricity use
12 associated with increases in electricity prices of the order
13 of magnitude I'm describing here. So I don't expect this to
14 have an appreciable impact on sales of electricity by TVA
15 within its service territory.

16 Q. And is TVA at risk of losing customers to surrounding
17 utilities based on your experience from the additional costs
18 associated with the emissions reductions sought by North
19 Carolina?

20 A. There is not a material risk that TVA faces that is
21 associated with this cost increase, in my opinion.

22 Q. And why is that?

23 A. There are a number of reasons.

24 As I indicated previously, the large share of utilities
25 surrounding TVA have higher rates than TVA, meaning that, if,

1 someone were able to choose where they got their power supply
2 and they were able to choose to buy from TVA, the trend would
3 be to seek to have TVA be a provider rather than have TVA be
4 exposed to having competitors come in.

5 That, of course, assumes that there would be a change in
6 law that removed the fence around TVA. And while there have
7 been some indications of interest in removing the fence so
8 that TVA's customers are able to have more options to buy
9 electricity from outside and others are allowed to sell into
10 TVA's service territory, those proposals over the years have
11 gone nowhere in Congress, and I don't think that there is a
12 significant threat TVA faces for having its service territory
13 invaded, if you will, by competitors.

14 Were that to occur, I think that TVA would have just as
15 strong chance to be able to convince Congress that it should
16 be able to sell outside of the fence if others can sell
17 inside of the fence.

18 So I think that there are sound economic reasons and
19 very strong political/statutory/legal reasons without opining
20 about it, as if I were a lawyer, which I am not, that lead me
21 to that conclusion.

22 **Q.** And did you look at the relative sales volumes for TVA
23 and companies in the area with lower rates and companies with
24 higher rates?

25 **A.** Yes.

1 Q. I'll show you Plaintiff's Exhibit 406 for
2 identification, and can you explain to us what that figure
3 shows.

4 A. Yes. Let me actually give a little context for the
5 figure.

6 I asked myself what if the law changed, what if the ring
7 or the fence around TVA were removed, how vulnerable would
8 TVA be, so that if it were forced to pay for a 3 to
9 \$5 billion program, would it likely find itself disadvantaged
10 from a competitive point of view?

11 So I wanted to see whether it was more likely to be
12 invaded by competitors with lower cost power so that TVA's
13 consumers would go seek supplies from lower cost providers,
14 or whether TVA actually would stand to gain market in a
15 situation where the ring or the fence went down around TVA's
16 boundary and TVA could compete outside, and I found that the
17 amount of demand in the portion of the region with lower
18 prices than TVA is smaller than the market with higher prices
19 than TVA.

20 So were the Congress to change the law such that TVA
21 lost its protection on its franchise, in my opinion, TVA, at
22 worst, would be held harmless and might actually have
23 opportunities to sell more outside, because of its low cost
24 of capital, its relatively cheap rate, its ability to do its
25 job at a -- all else equal, at a lower cost of service than

1 many of the other utilities in the service territory.

2 So this told me that, whereas TVA has identified the
3 risk associated with being invaded, so to speak, by suppliers
4 from Kentucky, which has lower prices, there are higher
5 prices being charged to consumers in Mississippi, Georgia,
6 North Carolina, South Carolina, Arkansas, et cetera, such
7 that TVA would be able to find a market where it would be
8 able to sell its electricity.

9 **MR. GOODSTEIN:** Your Honor, at this time we offer
10 Exhibit 405, 397, 398, 399, 400 and 406 into evidence.

11 **THE COURT:** All right. Let those be admitted.

12 **(Plaintiff's Exhibits 397, 398, 399, 400 405 and**
13 **406 received.)**

14 **MR. GOODSTEIN:** Thank you, Your Honor.

15 **BY MR. GOODSTEIN:**

16 **Q.** Dr. Tierney, did you have a chance to read the expert
17 reports submitted by Mr. Mitchell on behalf of TVA?

18 **A.** Yes, I did.

19 **Q.** Mr. Mitchell comments that there is some risk to TVA
20 that their service area could be restructured?

21 **A.** Yes.

22 **Q.** Did you consider that risk in your analysis?

23 **A.** Yes, I did.

24 **Q.** And what did you conclude?

25 **A.** That I don't consider it to be a substantial risk such

1 that my opinion about TVA's ability to finance this program
2 feasibly and reasonably would change. And partly, it's for
3 the reason I just described, which is that Congress would
4 have to change a law, and if Congress were to change a law,
5 TVA might just as well do well in that legal change as it
6 would do poorly.

7 And I also analyzed what was going on in trends in the
8 electric industry with regard to the increased pressures for
9 competition and what that might mean for TVA.

10 **Q.** All right. And what did you conclude there?

11 **A.** I concluded that I don't think that TVA stands to --
12 stands under significant pressure today for successful
13 pushing for competition within its service territory.

14 The past decade -- actually, the last 15 years, there
15 has been an overall trend in the electric industry toward the
16 introduction of market forces and the increase of
17 competition, and up through about 2001, there was growing
18 interest of states to open up the franchise areas of
19 utilities for competition, and it would have been
20 understandable as of that period of time for TVA to worry
21 about whether or not there would be significant pressure for
22 opening up the TVA service territory.

23 Then a number of things happened after that, including
24 the California electricity crisis in 2001, the Enron
25 bankruptcy, bankruptcy of a number of electric utility

1 companies, as well as power suppliers, and there has been a
2 slowing down of the pressure to open up electricity markets
3 around the country.

4 TVA's own strategic plan, in fact, identifies this
5 change in trends to lessen the pressure for competition,
6 especially in the states around TVA. And so I don't think
7 that this is a material risk for TVA at present.

8 Q. So referring your attention to Plaintiff's Exhibit 411
9 for identification, Dr. Tierney, and is this a copy of TVA's
10 strategic plan for 2007?

11 A. Yes, it is.

12 Q. And referring you to page 6 of that exhibit, what does
13 TVA have to say in its strategic plan about the status of
14 retail restructuring in the United States?

15 A. Well, let me just show you the text there at first. The
16 very first sentence says that TVA, in its issuance of its new
17 2007 plan, identifies that there are significant changes
18 since the last time it did its strategic plan, which was
19 2004. At that time, wholesale competitive market structures
20 were still expanding.

21 Since then, down in the second paragraph, it identifies
22 at the end of the paragraph, the last sentence reads,
23 consequently -- the second to the last sentence. I'm sorry.
24 "Consequently, wholesale competition is now evolving more
25 slowly and much of the focus is on governing transmission

1 access in bilateral markets."

2 The gist of what that means is that there is less
3 pressure on all transmission providers, like TVA and other
4 companies that own transmission wires, to open them up to let
5 other companies and other parties use their transmission
6 wires.

7 So whereas several years ago TVA might have worried,
8 justifiably, that there could be continued pressure in
9 Congress to remove the fence around TVA so that TVA could be
10 ordered to open up its transmission lines to carry power for
11 other power suppliers so that those other power suppliers
12 could sell it to TVA's distribution companies, this indicates
13 TVA's own view that that's no longer such a threat, and in my
14 opinion, that is very consistent with the trend in the
15 industry. TVA, I think, is not in a position to worry
16 significantly about this.

17 The bottom of this page just shows a map.

18 **Q.** Okay.

19 **A.** And this map shows a snapshot as of 2006, updated by TVA
20 in 2007, indicating where there has been movement amongst the
21 states to open up their electricity franchise areas to
22 competition.

23 You can see up in the northeast, those states have
24 opened up their utility service territory so a retail
25 customer can choose their electricity supplier. California

1 did that, but they suspended it after the electricity crisis.
2 That's why it's in red.

3 The black states on this map are states where the state
4 actually repealed a law allowing for competition in one form
5 or another in the state. And, in fact, since this map was
6 done, Ohio has similarly changed its law and, in fact, I
7 would personally paint that state as black on this map
8 because of the new law in Ohio.

9 The green states on this map are states not considering
10 restructuring. In other words, there's not a lot of pressure
11 in the legislature or regulatory commission to change the
12 rules to allow for more competition. So that in the area
13 surrounding Tennessee, there is not a lot going on that would
14 create pressure to open up TVA's service territory for more
15 pressure for competition.

16 I think this confirms TVA's view with, which I agree
17 with, which says that TVA is not likely to face increased
18 pressure for competition any time soon.

19 **Q.** So you wouldn't expect customers to leave the TVA system
20 as a result of additional cost of emissions reductions sought
21 by North Carolina?

22 **A.** I would not expect a material amount of customers to
23 move off. I would not say that there would never be a
24 customer that would do that. In fact, there have been two
25 customers who have left. One has already come back. Another

1 has -- is coming back this year. And there are three other
2 customers that have given notice that they may change, but
3 they represent, in total, 0.6 percent of TVA's sales. So I
4 don't think there is a risk of a material amount of sales
5 loss in TVA's customer service territory associated with
6 competitive pressures.

7 Q. And has TVA's CEO, Tom Kilgore, indicated that TVA
8 expects its sales volume to grow in the coming years?

9 A. Very much so.

10 Q. And this is reflected in Plaintiff's Exhibit 415 on page
11 23?

12 A. Yes. This shows that TVA's forecast is to continue to
13 increase its sales of electricity. TVA is planning around
14 this forecast. That means it's planning its generation
15 expansion consistent with needing to grow its amount of
16 electricity sales at 1.9 percent per year.

17 In my analysis, please recall that I assumed that TVA
18 would grow at about 1.5 percent. 1.4, 1.5 percent a year.
19 TVA itself is expecting to grow faster than I assumed in my
20 analysis, so I had a relatively conservative analysis. This
21 percentage increase in growth from year to year is higher
22 than the amount of sales that right now is on notice that
23 could leave TVA. That's 0.6 percent of total sales. This is
24 1.9 percent, growing each year.

25 Q. And just for clarification, we're talking about total

1 growth here, not just the growth from their coal-fired power
2 system.

3 **A.** Yes. That's right. This is sales to ultimate
4 customers, whether they're distributors or directly served
5 industrial customers. That's right.

6 **Q.** And did you consider Mr. Mitchell's comment that
7 debt-like instruments should be counted against the
8 \$30 billion debt ceiling that TVA operates under?

9 **MR. FINE:** Your Honor, I would interpose an
10 objection. I believe that's misrepresenting Mr. Mitchell's
11 report. I believe it's a question of whether that has to be
12 prudentially considered, given the position that the office
13 of management and budget has taken historically as to whether
14 those numbers should be counted towards the debt ceiling or
15 not.

16 **MR. GOODSTEIN:** I'd be happy to rephrase it, Your
17 Honor.

18 **THE COURT:** Rephrase your question and let me hear
19 it again.

20 **MR. GOODSTEIN:** Okay. Thank you, Your Honor.

21 **BY MR. GOODSTEIN:**

22 **Q.** Dr. Tierney, you're aware of the comments from
23 Mr. Mitchell about your consideration of debt-like
24 instruments in your analysis as opposed to types of debt that
25 are expressly provided for in the act that sets the ceiling

1 on TVA's debt? You're aware of those comments?

2 A. I am.

3 Q. Did you change your analysis as a result of those
4 comments?

5 A. No, I did not.

6 Q. Can you explain to us why you didn't feel it necessary
7 to change your analysis in light of those comments?

8 A. Yes. I will try to characterize Mr. Mitchell's position
9 on this.

10 TVA provides information through the president's budget
11 to Congress each year and indicates in that budget, under
12 instruction by the office of management and budget of the
13 U.S. government, that it should include not only the types of
14 debt which are statutory debt, the types of debt that are
15 covered by the \$30 billion ceiling, but also other financing
16 obligations, other debt-like instruments. These are these
17 prepayments and lease-back agreements. In essence, these are
18 things that TVA has entered into which are commitments to pay
19 somebody else back.

20 Bristol, Virginia, pre-pays TVA for a certain amount of
21 electricity that will be delivered in the future. It's like
22 debt in some sense, because it is prepaid and TVA has to
23 deliver a product for it.

24 Office of management and budget's position is that those
25 other financing obligations have to be included under a

1 \$30-billion debt ceiling. They are not stated as such in the
2 TVA Act, and I have read TVA documents that make it clear
3 that other financing obligations of that form do not cover --
4 do not count under the \$30 billion ceiling in TVA's opinion.

5 Mr. Mitchell said that, in light of OMB's position and
6 the fact that OMB has drafted a bill to submit to Congress,
7 that would count these other forms of debt, which may then
8 crowd the amount of new debt that could come under the
9 \$30 billion ceiling, that in light of that bill that's been
10 drafted, that I should have included that also.

11 In my opinion, there are several reasons why I did not,
12 and think it is reasonable not to include other financing
13 obligations under the \$30 billion ceiling. There are many
14 instances where TVA differentiates between statutory debt and
15 other debt. If OMB's position in a bill that's been drafted
16 but not submitted to Congress is that that would change,
17 Congress hasn't changed the law. I don't know whether
18 TVA's -- what TVA's position would be before the law. I
19 don't know whether the law would be passed by Congress. And
20 I don't know whether Congress would in fact raise the
21 \$30 billion ceiling if it were also adding new things that
22 would come under a ceiling. The \$30 billion has actually
23 been in place many, many years, and so one would think, with
24 the time value of money, that that actually might change.

25 So I took today's law, I used that as the template for

1 understanding what should go under the \$30 billion, and, as I
2 say, TVA itself uses that approach when it is speaking to
3 bondholders about what it is obligated to pay under the
4 \$30 billion ceiling. So I feel very confident that that's a
5 reasonable approach.

6 **Q.** And what about Mr. Mitchell's comment that you didn't
7 use a sophisticated enough rate analysis?

8 **A.** Mr. Mitchell says that when a utility like TVA is
9 actually setting its rates and figuring out how to go about
10 an investment and then spread it across different customer
11 classes, that TVA uses very sophisticated modeling tools to
12 carry that analysis out. Indeed, TVA would be doing that if
13 it were actually setting rates to recover these costs.

14 In my opinion, the structure of my analysis is identical
15 to the structure of the way TVA does it, and the details are
16 not important for the matters to present to you here. The
17 simplifying assumptions that I made are consistent and
18 appropriate for the question of whether or not TVA can fund
19 an additional 3 to 5 billion and recover it in rates. So if
20 and when TVA is actually compelled to do this program, TVA
21 will figure out, using its sophisticated tools and models,
22 the timing of passing the dollars through to consumers in
23 rates, and TVA will use its management acumen, its
24 sophisticated analysis, its political skills and judgment
25 appropriately to decide which types of consumers should have

1 slightly higher than average rate increase, what types of
2 consumers should have a lower than average rate increase
3 associated with the program. That's what TVA does all the
4 time. And it wasn't necessary or appropriate for what my
5 analysis says to be -- to go through that analysis.

6 I'm very familiar with the types of tools TVA is
7 describing. It is entirely appropriate for them to use them
8 in their day-to-day management of their rate setting. But it
9 is overkill for what is appropriate, in all due respect, to
10 put before the Court, in terms of understanding the order of
11 magnitude of this impact on TVA's financing of the program
12 and its cost impact to consumers.

13 **Q.** And what about Mr. Mitchell's comment on your use of
14 retail versus wholesale in comparisons?

15 **A.** Mr. Mitchell suggests that because I do an analysis that
16 looks at what would be the rate impact to a real household or
17 a real industrial customer that I'm understating the impact
18 by looking at that end-user impact. He says, had I actually
19 looked at the dollar impact on TVA's portion of the rate, the
20 wholesale portion of the rate, it would have been a higher
21 rate impact. He's right. It would have.

22 What I mean by that is, when you think about an
23 electricity rate, there's a part of it that's for
24 transmission and power production, and there's a part of it
25 that's associated with covering the cost of the local

1 service, the wires, the local trucks that repair the service,
2 that meter local service. So the rate is split between those
3 local costs and the wholesale costs. If I had added the rate
4 increase on TVA's association of the bill, wholesale
5 portion, mathematically, the rate increase would have been
6 higher. He's absolutely right on that.

7 But from the point of view of putting myself in the
8 shoes of the board of directors of the TVA, what I'm really
9 interested in seeing is whether or not my ultimate consumer
10 base can absorb an impact as it hits their pocketbooks, and
11 that's a fully blended wholesale and retail rate. So in my
12 opinion, that's the appropriate rate to look at. I know that
13 TVA uses retail rates when it does rate comparisons as well.

14 Q. And finally, Dr. Tierney, how did you consider
15 Mr. Mitchell's comments about the depreciation time and the
16 shape of the investment curve that you used in your analysis?

17 A. Yes. Please recall that I indicated I assumed that the
18 pollution control equipment would wear out over a 30-year
19 period, as Dr. Staudt had instructed me to think about it.
20 So I paid for it through a depreciation charge, if you will,
21 that is tied to the life of the asset. It's a straight-line
22 depreciation. $1/30$ of the amount of the investment gets
23 depreciated in each year over 30 years.

24 Mr. Mitchell suggested that it would be more appropriate
25 if I had depreciated it over the life of the number of years

1 of the contract notice period under which consumers could
2 leave TVA's system. In other words, if a customer, a
3 distribution customer, could give a five-year or ten-year
4 notice period, TVA should pay back all of the debt associated
5 with this pollution control period over that five or ten-year
6 notice period in the contract. That is completely counter to
7 what TVA's policy is for depreciation. TVA's policy is to
8 depreciate investment over the life of the asset, and TVA's
9 information statement and SEC statement say that that's TVA's
10 normal policy.

11 **Q.** So, finally, what is your overall conclusion,
12 Dr. Tierney, after you've completed your analysis and
13 considered the expert reports submitted by Mr. Mitchell with
14 regard to the financial feasibility and reasonableness of the
15 additional pollution controls sought by North Carolina in
16 this case?

17 **A.** In the end, well, 3 to \$5 billion is a large sum of
18 money. In the end, I concluded, for a utility of the size,
19 sophistication, financing capabilities, rate-making
20 authorities of TVA, that a pollution control program
21 amounting to 3 to \$5 billion is financially feasible and
22 financially reasonable. TVA can undertake this program with
23 a reasonable rate impact on consumers. It will be able to go
24 to debt markets. It will be able to raise rates to recover
25 the cost, and it is a relatively small impact on the -- on

1 the overall rates that consumers pay in the Tennessee Valley
2 Authority area.

3 **MR. GOODSTEIN:** Have no further questions of
4 Dr. Tierney at this time, Your Honor.

5 **THE COURT:** All right. We will take our luncheon
6 break and be back at 2:45.

7 **(Recess.)**

8 [END OF VOLUME 7A]

9 * * * * *

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11
12 UNITED STATES DISTRICT COURT
13 WESTERN DISTRICT OF NORTH CAROLINA
14 CERTIFICATE OF REPORTER

15 I certify that the foregoing transcript is a
16 true and correct transcript from the record of proceedings
17 in the above-entitled matter.

18 Dated this 24th day of July, 2008.

19
20 S/ Karen H. Miller

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Karen H. Miller, RMR-CRR
22 Official Court Reporter
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